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Associates Inc

HART

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SITE OPERATIONS PLAN
NATIONAL GYPSUM COMPANY
(Millington, Great White Swamp,
257 New Vernon Road and
White Bridge Road Sites)

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(1047A-1)

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1.0 INTRODUCTION

Fred C. Hart Associates, Inc. (HART) has been retained by National Gypsum Company to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the Millington Site and the Great Swamp, White Bridge Road and 257 New Vernon Road Sites ("the satellite sites") pursuant to CERCLA-Administrative Order-50103 ("Consent Order") between National Gypsum Company and the United States Environmental Protection Agency (EPA). EPA has identified National Gypsum as a potentially responsible party.

Pursuant to the Consent Order, this Site Operations Plan is being submitted to EPA for review and approval. The Site Operations Plan has been divided into the following seven sections:

1. Introduction
2. Remedial Investigation Work Plan
3. Project Organization
4. Project Schedule
5. Work/Quality Assurance Project Plan
6. Health and Safety Project Plan
7. Contingency Plan

The above sections provide detailed information on the implementation of the activities delineated in Appendix I (the RI/FS Work Plan prepared by NUS Corporation) of the Consent Order.

2.0 Remedial Investigation Work Plan

The purpose of the Work Plan is to provide detailed information necessary to carry out the Remedial Investigation (RI) at the Millington Site and the Great Swamp, 257 New Vernon Road and White Bridge Road Sites ("the satellite sites") in conformance with the Consent Order. The goal of the remedial investigation is to evaluate the extent and magnitude of contamination of the air, soils, sediments, surface water and groundwater in the vicinity of all four sites and the stability of the asbestos pile at the Millington Site. The results of the remedial investigation will be used to determine the most feasible remedial alternatives required to alleviate any contamination problems.

2.1 Collection and Evaluation of Existing Data (Task 1)

Prior to initiating work, Fred C. Hart Associates (HART) will compile archival aerial photos available from the NJDEP Geological Survey Element, USDA Agricultural Stabilization and Conservation Services (ASCS), USDA Soil Conservation Service (SCS) and other sources. Examination of these photos may provide information regarding the development of the asbestos hill and the disposal area within the Great Swamp. The photos will be required in order to plan field reconnaissance and subsurface exploration.

In addition, to fully evaluate the environmental setting at the Millington property and satellite sites, both regional and local geologic data will be obtained. This data will include geologic and hydraulic reports, topographic maps, and other information available from the state and U.S. Geological Surveys.

2.2 Health, Safety and General Site Reconnaissance (Task 2)

HART has already conducted an initial site reconnaissance of the Millington and Great Swamp Sites to determine health and safety requirements for dermal and respiratory protection and define areas of asbestos

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waste disposal. Additional site reconnaissance will be required to delineate potential areas of asbestos waste disposal at the 257 New Vernon Road and White Bridge Road Sites. Should an immediate health hazard exist, National Gypsum or its agents will immediately notify EPA and NJDEP and shall take all reasonable steps, with the approval of EPA and NJDEP, to mitigate the danger expeditiously. Disposal areas at all four sites will be flagged prior to commencement of the subsurface investigation.

The initial surface water/sediment sampling survey may be conducted as a part of this task. Surface water/sediment sampling procedures are presented in Section 2.10, Environmental Sampling and Monitoring.

2.3 Permits, Rights of Entry and Other Authorization (Task 3)

Before any site work can begin, care must be taken to obtain all permits and clearances needed to perform the Remedial Investigation (RI) activities. All utility clearances will be obtained by HART from the various utility companies. Right-of-entry authorization will be obtained from TIFA, Ltd. and the United States Fish & Wildlife Service for the Millington and Great Swamp sites, respectively. A wetlands permit for the Great Swamp Site will be obtained, if necessary. HART will make an initial attempt to obtain access to private property. If permission is denied, EPA will be immediately informed, and a request for EPA assistance in gaining site access will be made. Well authorization permits will be obtained from NJDEP before installation of monitoring wells.

2.4 Topography and Boundary Survey (Task 4)

The object of this task is to develop plot plans and topographic maps for the Great Swamp, 257 New Vernon Road, White Bridge Road, and Millington Sites. The plot plans and topographic maps will be prepared by Azzolina & Feury Engineering Company, Professional Engineers and Land Surveyors.

The land surveyors will conduct a title search for the Millington, 257 New Vernon Road, and White Bridge Road Sites. Based on the information obtained from the title search and the U.S. Fish and Wildlife Service, the surveyors will conduct a property line survey for the four sites. This work will include staking out the boundaries, locating old monuments and/or placing new monuments, and establishing horizontal and vertical control. Information obtained during the survey will be transferred onto a base map for each site. Due to the inadequacies of the current topographic mapping at the Millington Site, the surveyor will survey the area in and around the asbestos hill. The topographic information (two-foot contours) will be placed on the base map.

Final plot plans and topographic maps of all the sites will be drawn to suitable scales following definitions of the location and extent of asbestos shingle disposal, as identified during the general site reconnaissance, and areas in the immediate vicinity which will serve as points of reference.

2.5 Site-Specific Health and Safety Requirements (Task 5)

See Section 6.0 of this document.

2.6 Site-Specific Quality Assurance/Quality Control (QA/QC) Requirements (Task 6)

See Section 5.0 of this document.

2.7 Site Operations Plan (Task 7)

The Site Operations Plan will be approved by EPA and NJDEP prior to the implementation of field activities.

2.8 Subsurface Investigation (Task 8)

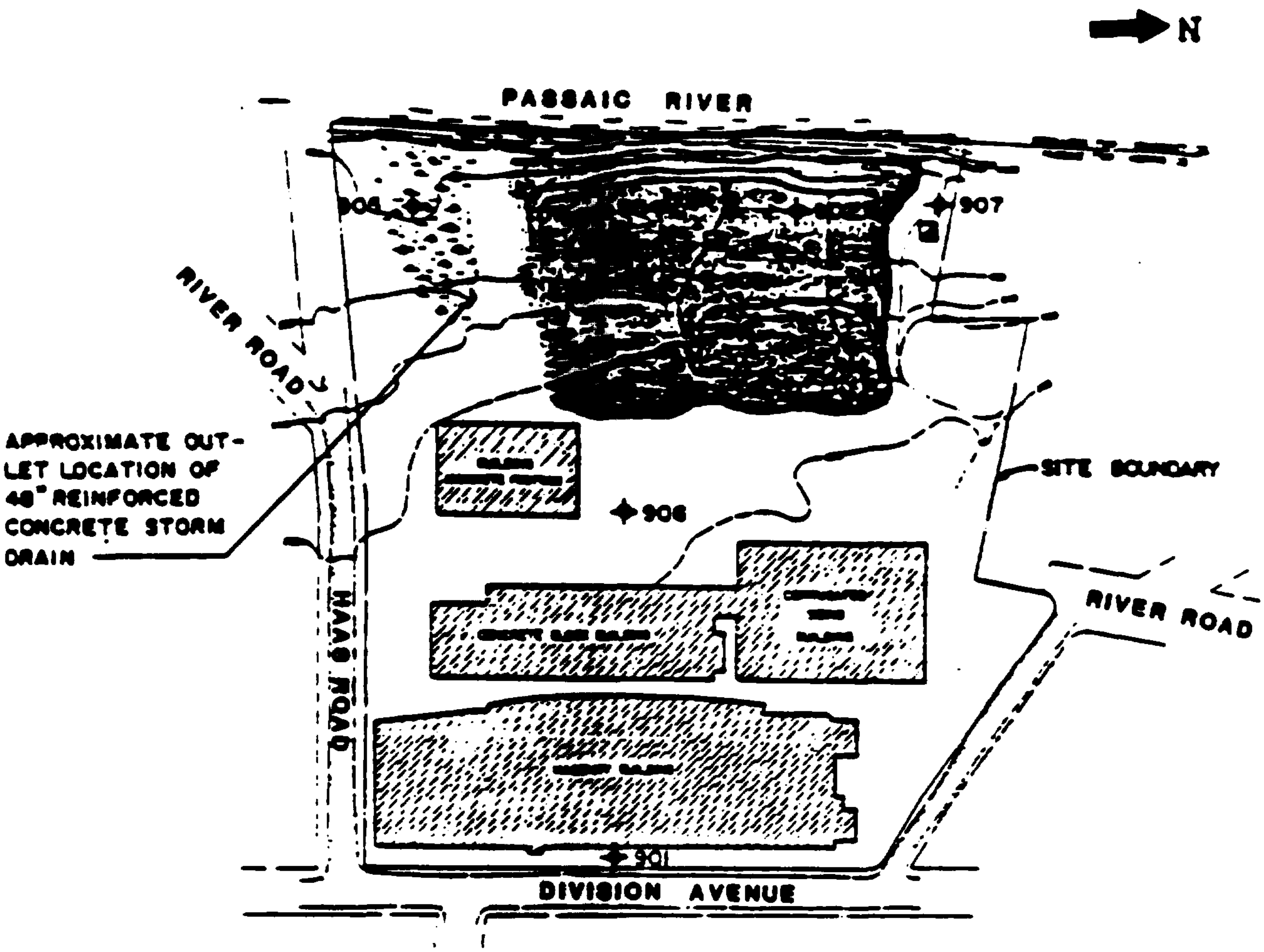
The purpose of the subsurface investigation is to determine the nature and extent of disposed materials and to obtain detailed information on geologic and hydrogeologic conditions. A combination of deep test borings drilling into bedrock and shallow borings ending in unconsolidated material are planned to determine the thickness of disposed materials, site stratigraphy and hydrogeologic regimes. Wells will be installed in selected test borings in order to evaluate groundwater quality and flow directions, and to assess the permeability of the shallow hydrogeologic units.

Prior to the commencement of the subsurface investigation activities, all drilling equipment will be decontaminated by steam-cleaning in an area specifically designated for decontamination. In addition, the hollow-stem augers and drilling equipment will be steam-cleaned between each boring at the decontamination area. All decontamination rinsewater will be collected and held until a determination can be made as to whether or not it must be disposed of as a hazardous waste. All sampling equipment will be certified laboratory-clean prior to the commencement of work. Decontamination procedures for the sampling equipment between samples are described in Section 2.8.1.

Because of differences in the site sizes and anticipated impacts to the environment, site operations plan for the subsurface investigation at each of the four sites will be described individually.

2.8.1 Hydrogeologic Investigation (Subtask 8.1)

Millington Site. In order to determine the shallow groundwater flow direction at the Millington Site, seven monitoring wells will be installed. Figure 2-1 shows the tentative placement of the seven monitoring wells. Each successive borehole location will be selected based upon results from the previous wells.



SOURCE: TAKEN FROM DRAWING Nº 6667; AUGUST 17, 1977; YANNACONE ASSOCIATES, INC.
BERNARDSVILLE, NJ

BUILDINGS: TIFA, LTD. OFFICE COMPLEX.

LEGEND

- MONITORING WELL LOCATION
- TEST PIT LOCATIONS
- APPROX. LIMIT OF ASBESTOS HILL
- SWAMPLAND

SCALE: 1"=200'

SOURCE: NUS CORPORATION

FIGURE 2-1
MONITORING WELL AND TEST PIT LOCATIONS

MILLINGTON SITE
MILLINGTON, NJ

FRED C. HART ASSOCIATES, INC.

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All borings will be advanced to bedrock using eight-inch inside diameter hollow-stem augers. All split-spoon samplers used at each boring will be laboratory-cleaned prior to sampling and decontaminated between samples using the following procedures:

- Initial wash with Aloconox detergent
- Tap water rinse
- Deionized water rinse
- Solvent rinse with methanol or acetone
- Solvent rinse with hexane (between samples only)
- Deionized water rinse or air-dry.

All sampling equipment pre-cleaned in the laboratory will be wrapped in heavy aluminum foil for transport to the field. These decontamination procedures will be followed at all four sites.

Continuous split-spoon samples will be taken at wells 903, 905 and 906. At wells 901, 902, 904 and 907, split-spoon samples will be taken at 2.5-foot intervals and at changes in lithology or zones exhibiting contamination.

A detailed log of all materials encountered and groundwater conditions will be kept by the site geologist during drilling. All split-spoon samples will be monitored for head-space analysis with an Organic Vapor Analyzer (OVA) and the results recorded in the field log book. Samples showing readings above background levels will be submitted for Priority Pollutant plus forty analysis. One of the wells will be constructed within the bedrock and will be used to determined background water quality. This well (No. 901) will be utilized as an upgradient monitoring well based upon the presumed groundwater flow toward the Passaic River.

At location 901, a monitoring well will be constructed in accordance with "New Jersey Department of Environmental Protection Rock Monitor Well

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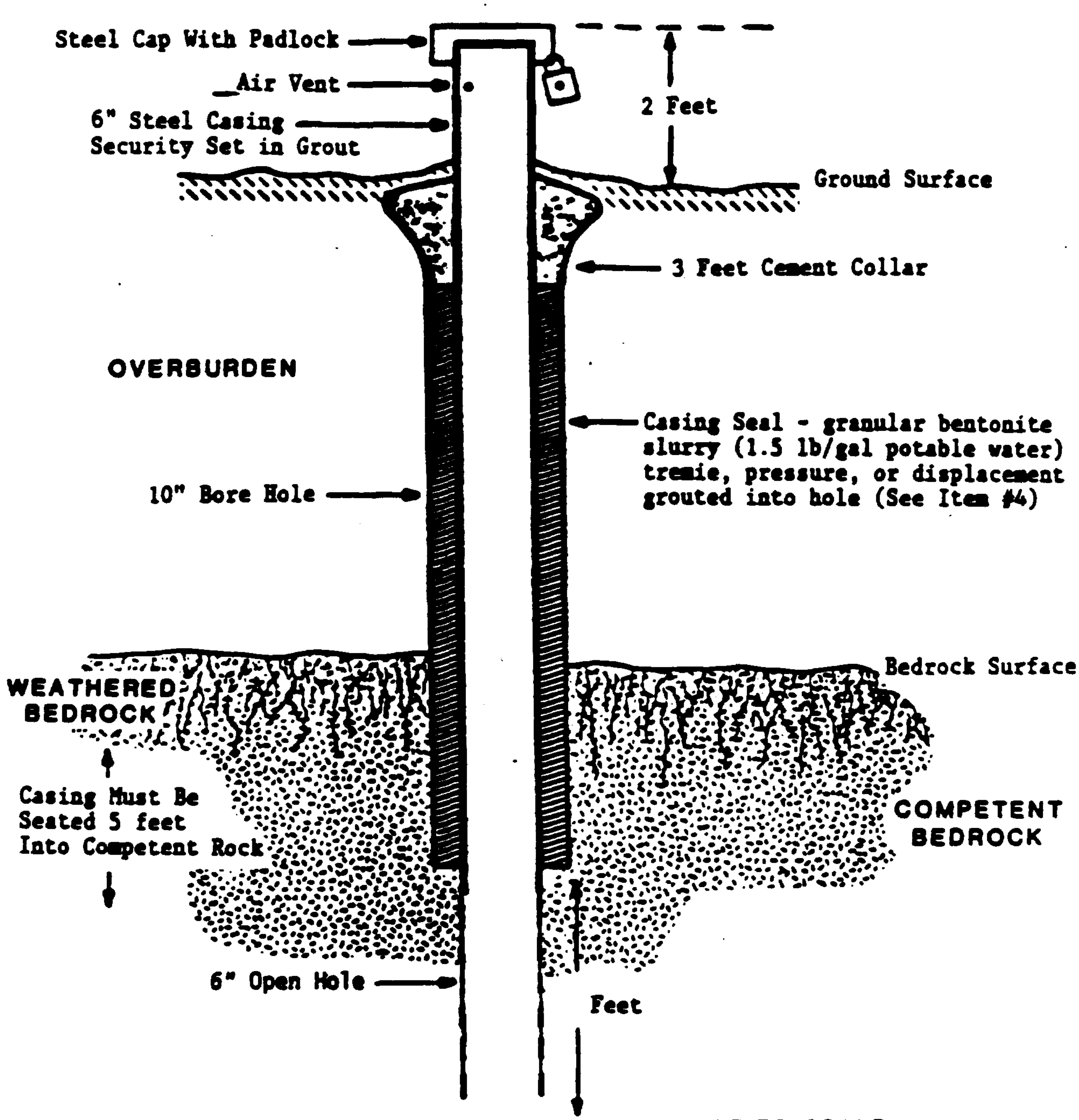
Specifications (Figure 2-2), if the water table is located in unconsolidated material. The boring will be advanced to bedrock using an eight-inch inside diameter hollow-stem auger. If the water table does not occur in the unconsolidated materials, an eight-inch diameter bit will drill into competent rock. Six-inch inside diameter galvanized steel casing will be set into this hole. The augers will be retracted while backfilling the annulus with a bentonite-cement slurry to prevent the hole from caving. The hole will then be drilled through the steel casing into bedrock with a compressed air drilling technique. The hole will be advanced to a depth of ten feet below the water table.

After the final drilling is completed, a three-foot cement collar will be placed around the top of the well to divert surface water away from the well. A protective steel casing with a locking cap will be installed on the top of the well. The well permit number will be permanently affixed to each monitoring well. All of the remaining wells will be constructed utilizing the same methods.

When the water table occurs in unconsolidated material, wells will be constructed in accordance with "New Jersey Department of Environmental Protection Unconsolidated Monitor Well Specifications" (Figure 2-3). As previously described, borings will be advanced using an eight-inch inside diameter hollow-stem auger. A well constructed of four-inch diameter 316 stainless steel and ten-foot long slotted stainless steel screen will be installed. Casing will extend two feet above ground level.

A gravel pack will be emplaced to a height of one and a half feet above the top of the screen. A two-foot thick bentonite pellet seal will then be placed on top of the gravel pack and a bentonite-cement slurry will be used to backfill the remaining annulus of the well. A locking, protective five foot section of the steel casing will then be installed over the well and cemented into place. The well permit number will be permanently affixed to each monitoring well.



NOT TO SCALE

FIGURE 2-2
ROCK MONITOR WELL CONSTRUCTION

MILLINGTON SITE
MILLINGTON, NJ

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SOURCE: NJDEP

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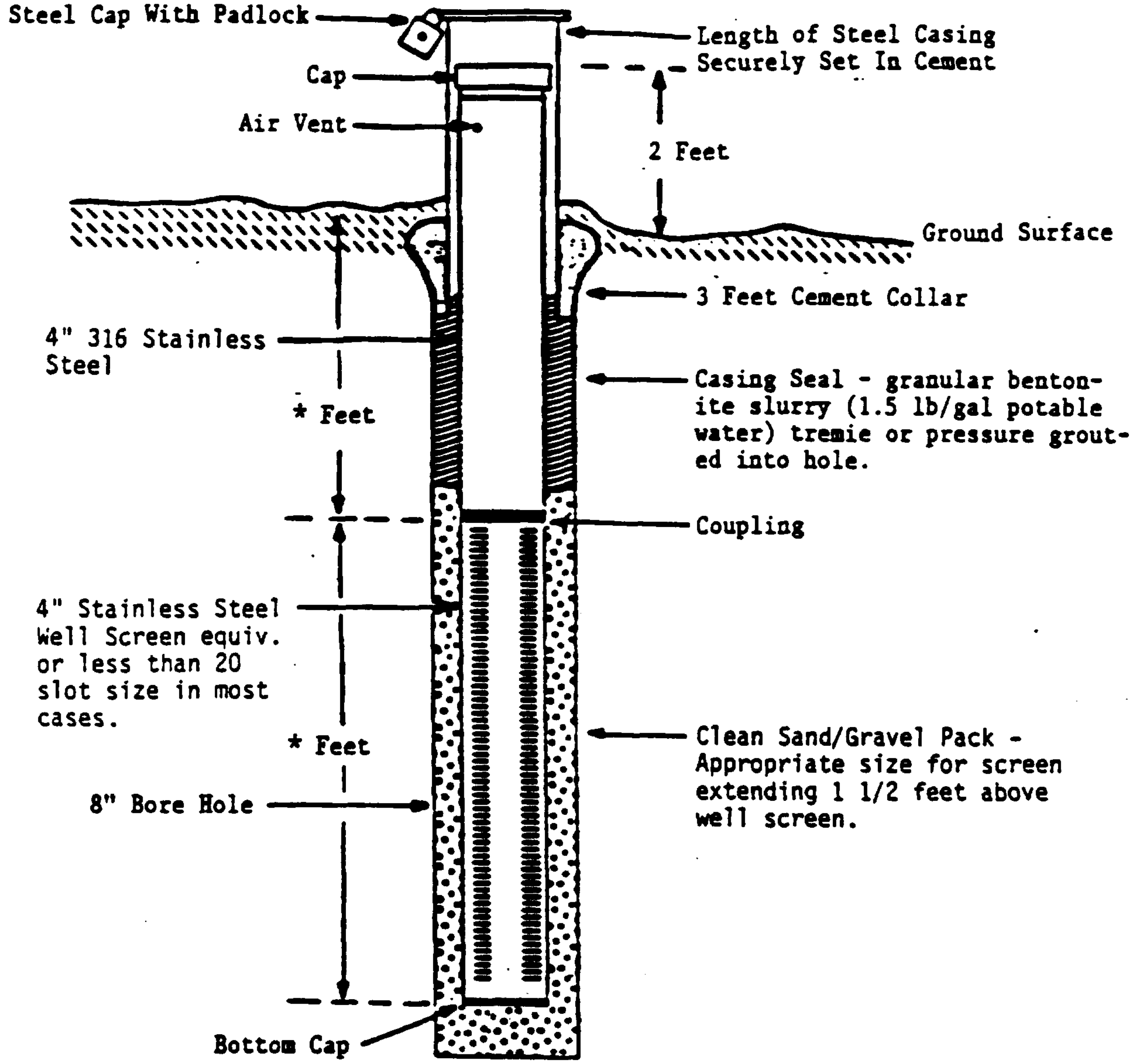

NOT TO SCALE

* field determined

SOURCE: NJDEP

FIGURE 2-3

UNCONSOLIDATED MONITOR WELL CONSTRUCTION

MILLINGTON AND SATELLITE SITES
MORRIS COUNTY, NJ

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Great Swamp Site. A series of 15-20 hollow stem auger borings are proposed for the Great Swamp Site. In ten of these borings, wells will be installed into unconsolidated material. Figure 2-4 provides proposed groundwater well locations. If the hydrogeology appears complex, more test borings and wells may be constructed.

10 wells

All test borings and monitoring wells will be constructed using the same procedures as those described for unconsolidated monitoring wells at the Millington Site. Wells will be finished approximately five feet below the water table. Split-spoon samples will be taken in advance of boring, at 2.5 foot intervals and within changes in strata. Decontamination procedures to be followed will be the same as those described for the Millington Site. Individual boring locations may be altered based upon field observations at the discretion of the site geologist.

In the event that the Great Swamp Site is inaccessible to a truck-mounted drilling rig, alternative plans for the hydrogeologic investigation will be developed and approved by EPA before site work is begun. A suggested alternative to truck-mounted drilling equipment could be the use of a hand-held power auger for borings with the installation of two-inch monitoring wells.

White Bridge Road and 257 New Vernon Road Sites. At each of these sites, shallow test borings and monitoring wells will be installed. Three borings/wells will be constructed at each site in order to define the shallow hydrologic conditions and the extent of wastes at each site. Sampling and decontamination protocols for each site are identical to those described for the previous two sites. Each boring will be advanced with an eight-inch hollow-stem auger and sampled with a split-spoon at 2.5-foot intervals. The borings will be terminated approximately ten feet below the water table. Identical well construction methods to those previously described will be employed at each of the two sites. Figure 2-5 provides monitoring well locations for the White Bridge Road site and Figure 2-6 provides well locations for the New Vernon Road site.

3 wells

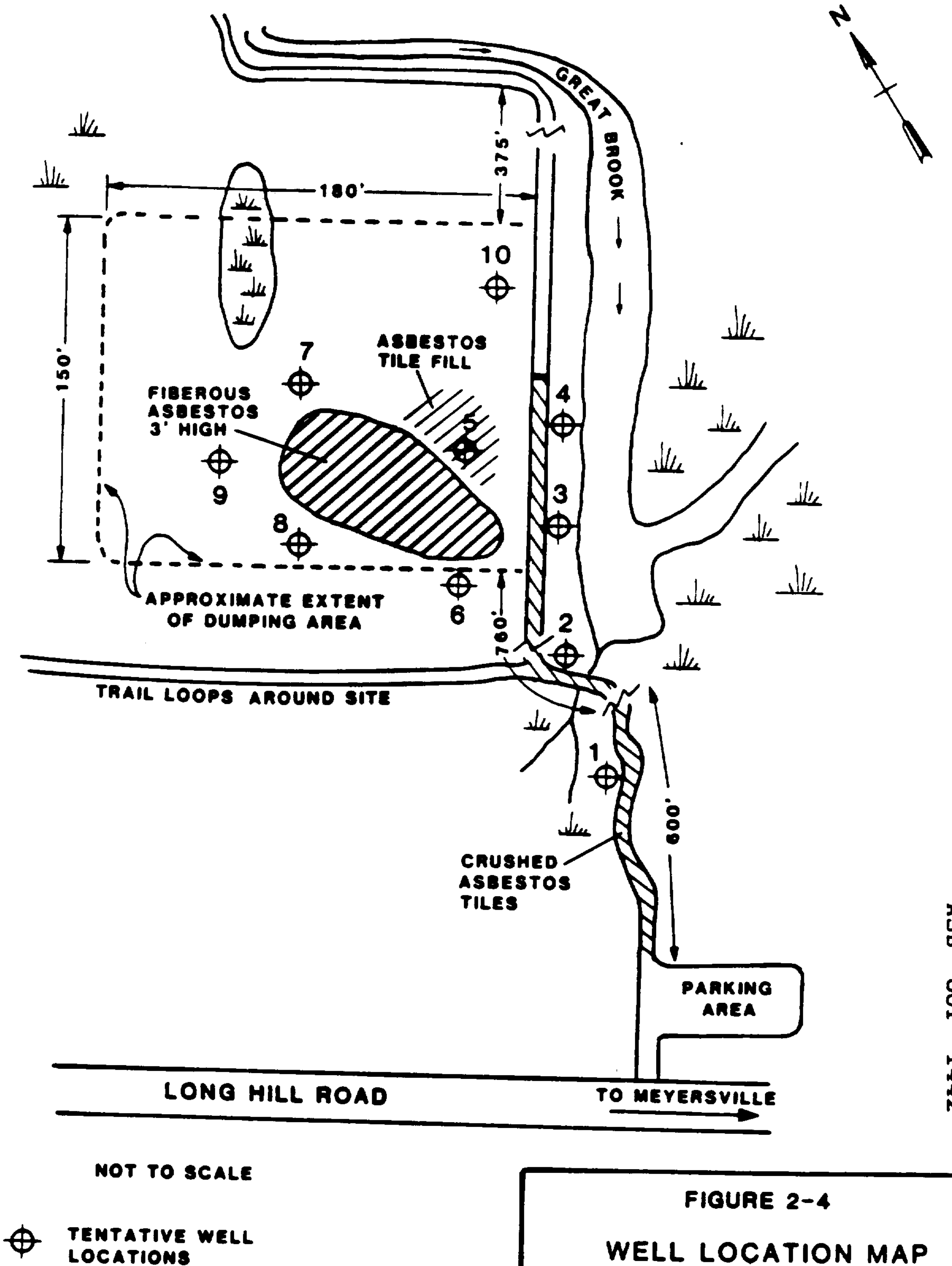

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FIGURE 2-4

WELL LOCATION MAP
GREAT SWAMP SITE

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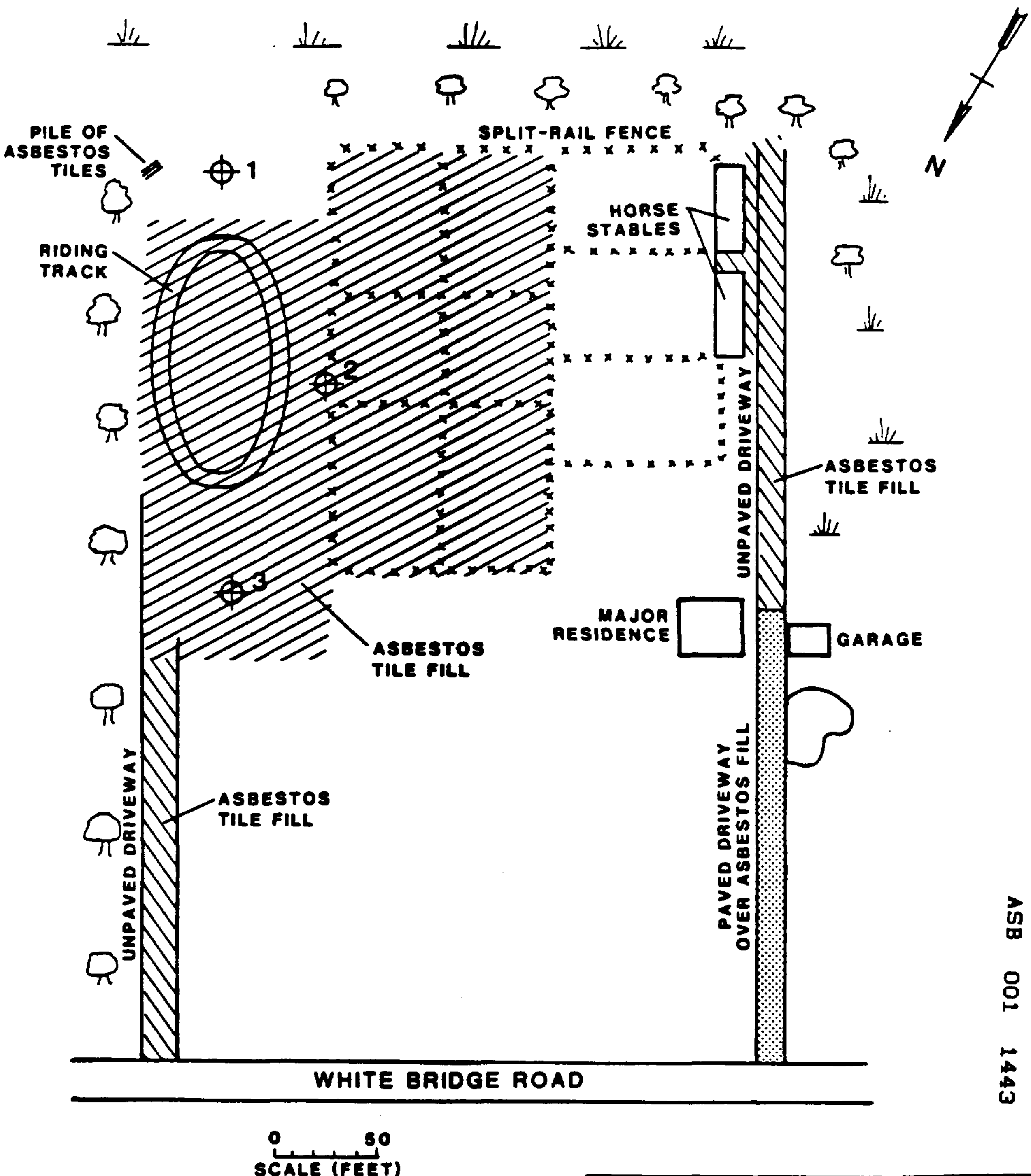

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FIGURE 2-5

WELL LOCATION MAP
WHITE BRIDGE ROAD

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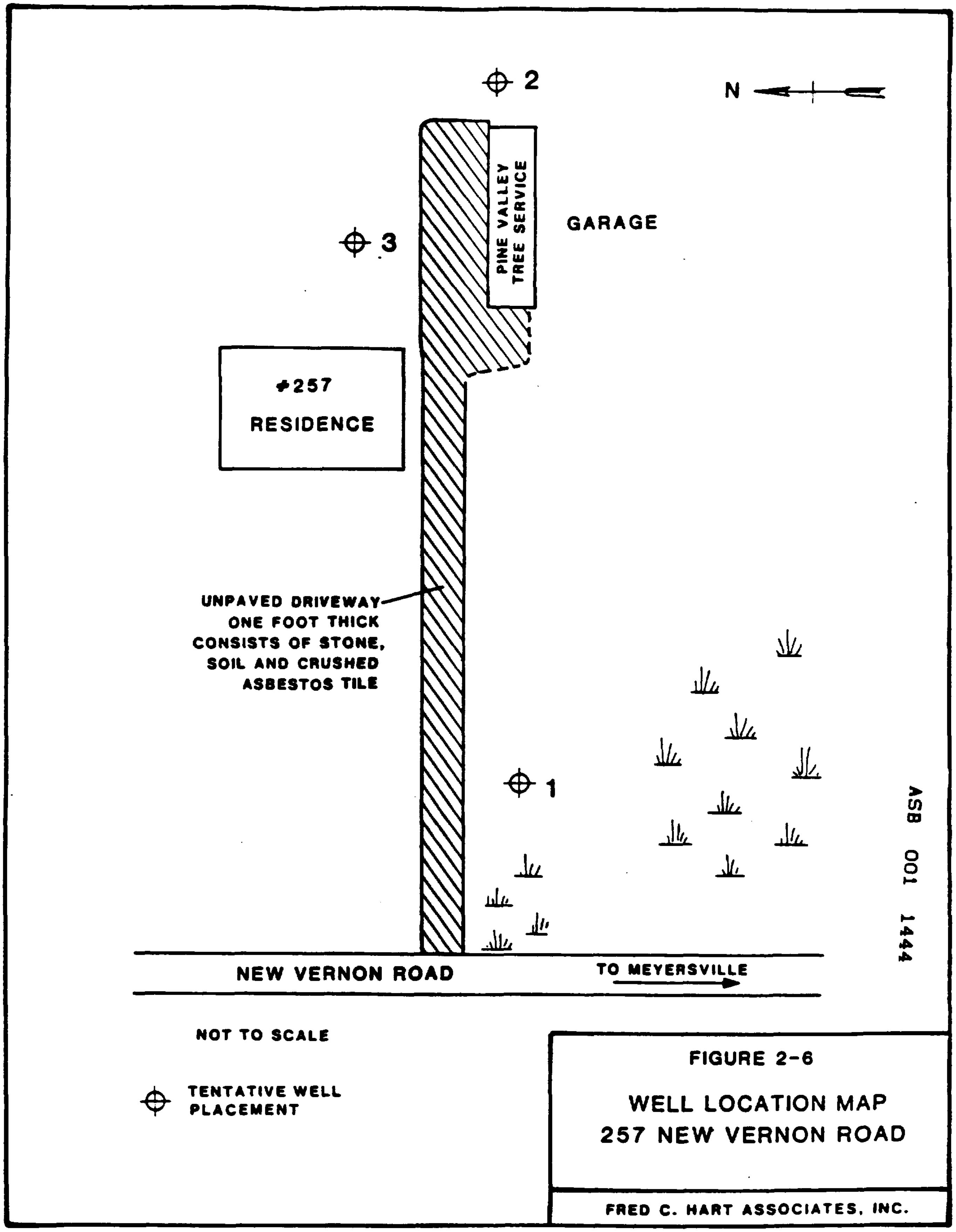

FIGURE 2-6

WELL LOCATION MAP
257 NEW VERNON ROAD

At each of the sites, all wells will be developed by purging with a bailer, pump or other method to remove fines, clean the well screens and develop the gravel pack surrounding the well screen. Water will be removed until it is visibly free of sediment. All monitoring wells will be allowed to rest for a minimum of two (2) weeks after development prior to being sampled.

2.8.2 Aquifer Interpretation (Subtask 8.2)

The initial extent and nature of the hydrogeologic units will be determined from data gathered during drilling. After well development, a falling-head or rising-head test will be conducted on selected wells. The data will be integrated using the Hvorslev method.

Cross-sections will be prepared and stratigraphy will be compared to the hydraulic properties obtained from the aquifer tests. Water levels will be measured, both in the boreholes (during drilling) and in the finished wells (before sampling). These measurements, when integrated with ground surveying data, will be used to determine piezometric surfaces.

2.8.3 Engineering Investigation (Subtask 8.3) support study of feasible alts

An engineering investigation program in the study areas, in conjunction with the hydrogeologic investigation described in Subtask 8.1. The engineering program is designed to produce data which will assist in defining the following properties:

- Soil types and stratification.
- The physical characteristics and properties of the materials at the sites.
- The interface characteristics between fill material and in-situ materials.
- The internal structure/condition of the fills.
- The extent of materials placed at the sites.
- The existence of any lagoon structures at the Millington Site. An engineering analysis of foundation soils, including estimates

of total and differential settlements, settlement potential, bearing capacity, and site slope stability analyses (Millington Site, only).

- An analysis of surface soil characterization for revegetation potentials, specifically soil, pH, organic content, fertilizer and binder requirements.

The engineering program will proceed simultaneously with the hydrogeologic investigation. The drilling program will involve the use of hollow-stem augers which will enable samples to be taken in advance of boring while drilling progresses. Sampling methods will include split-spoons and Shelby tubes. In addition, samples may be collected from the test pits. Samples will be described in the field using the Unified Soil Classification System.

At the Millington Site, at least 14 Shelby tube samples will be taken from within the asbestos hill. At each boring, Shelby tubes will be taken at 10-15 feet below grade (bg), 25-30 feet (bg) and in in-situ soils. In addition, a minimum of six Shelby tube samples will be taken at two locations below the asbestos hill to develop an engineering analysis of subsurface conditions. At the discretion of the site engineer, additional Shelby tube and split-spoon samples may be taken.

For the purposes of the engineering investigation, the Standard Penetration Test (SPT) will be performed on all split-spoon samples. The Standard Penetration Test requires a 140-pound drive hammer with a 30-inch fall. Blow counts for each six inches of penetration will be recorded in the boring log. A standard three-inch diameter Shelby tube with a 24-inch length will be used for all undisturbed samples. If the Shelby tube must be driven instead of pushed to penetrate the soil, then the weight, height-of-fall and number of blows will be recorded in the boring log.

It is anticipated that borings 903 and 906 will be drilled first in order to gather information about the extent of the asbestos pile, paint wash line lagoon and site stratigraphy. Based upon this data pertaining to the stability of soils and asbestos wastes, the locations of borings 902 and 904 can be adjusted if necessary. In all cases, boreholes and equipment will not be located near the proximity of the crest of slopes or any other area where chance of slope failures is present.

In order to determine the feasibility of slope revegetation, two surface soil samples will be sent to the local/county Cooperative Soil Service to determine if in-situ soils at the Millington Site will support ground cover.

In addition the to proposed boring program, test pits will be used at the Millington site to detail the spoil and in-situ materials. Presently, two test pits are planned, one in the waste pile and one near the upstream side slope of the waste pile. The test pit adjacent to the waste pile will be excavated in in-situ soils to the top of the bedrock (assumed to be approximately five feet, based upon a previous site visit). The test pit into the asbestos pile will be located based upon field determinations and will be excavated to the maximum depth (not greater than 15 feet) permissible in accordance with site and construction safety procedures.

Both test pits will be constructed using a rubber tire backhoe with an approximate bucket extension of 15 feet. The site geologist will keep a complete description of materials encountered and observations in the field test pit log. Both test pits will be constructed in a safe and proper manner in accordance with the Site Health and Safety Plan. The asbestos will be wetted down throughout the test pit operations.

At the Great Swamp Site, procedures for hollow-stem auger borings and split-spoon sampling, specified in Subtask 8.1 (Hydrogeologic Investigation) will be followed. The Standard Penetration Test will be utilized for all soil sampling with the split-spoon. Shelby tube samples may be taken at the discretion of the site engineer.

Based on the limited information available at the 257 New Vernon Road and White Bridge Road Sites, engineering investigations do not appear to be required in these areas. However, if the site reconnaissance activities or future information warrant such studies, this site operations plan will be modified to reflect such a change and will be subject to EPA approval.

2.8.4 Laboratory Analysis for Engineering Properties (Subtask 8.4)

Laboratory testing of the undisturbed soil and spoil materials will be performed on all Shelby tubes taken at the Millington Site. The tests listed below will enable an evaluation of the mass stability of the asbestos hill. The following tests are proposed for the Millington Site only:

- Atterberg Limits
- Particle Size Analysis
- Specific Gravity
- Moisture Content
- Unit Weight
- Triaxial Compression Strength Testing
- Consolidation Tests for Compressibility of Underlying Materials

The basic tests (the first five listed above) will be required to classify the spoil materials and in-situ soils. Particle size analysis uses the following U.S. standard sieve sizes and numbers: 3-inch, 2-inch, 1-inch, .75 inch, .50 inch, No. 4, No. 10, No. 20, No. 40, No. 60, No. 100 and No. 200. Tests will be performed on samples selected by the engineer.

Triaxial compression strength testing will be performed on the asbestos spoil material and in-situ soils. The strength parameters that are determined from these tests will be used in the analysis of the stability of the pile. At present, the materials are assumed to be homogeneous, and only two sets of triaxial strength tests are planned. Additional testing may be required if the materials are found not to be relatively homogeneous.

2.9 Field Survey (Task 9)

Following completion of the monitoring well installation in Section 2.8, the surveyor will establish the horizontal and vertical coordinates of all wells. The horizontal and vertical control established during Section 2.4 will facilitate the location of the wells. All wells will be plotted on the base mapping prepared during Section 2.4, Topographic and Boundary Survey.

Any other features noted during site activities requiring preservation on the base mapping will be surveyed at this time.

2.10 Environmental Sampling and Monitoring (Task 10)

For the purposes of this Work Plan, all environmental sampling requiring laboratory analysis will be presented in this task. However, the actual time of field sample collection is provided below:

Surface Water and Sediment	Task 2	Health, Safety and General Site Reconnaissance
Benthic Macroinvertebrates	Task 2	Health, Safety and General Site Reconnaissance
Ambient Air	Task 8	Subsurface Investigations
Subsurface Soil/Waste	Task 8	Subsurface Investigations
Groundwater	Task 8	Subsurface Investigations
Groundwater (monitoring)	Task 10	Environmental Sampling and Monitoring
Surface Water (monitoring)	Task 10	Environmental Sampling and Monitoring
Potable Wells	Task 10	Environmental Sampling and Monitoring

This sampling plan has been prepared as a part of the Site Operations Plan and complies with Section 5.0, Work/Quality Assurance Project Plan.

2.10.1 Surface Water and Sediment Sampling (Subtask 10.1)

Surface water and sediment samples will be collected during Task 2, Health, Safety and General Site Reconnaissance, to define the extent of

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contamination in the Passaic River and its tributaries, Great Brook and Black Brook. Preliminary sampling locations are listed in Table 2-1 and shown in Figure 2-7. All aqueous samples will be analyzed in the field for pH, specific conductivity and temperature, and submitted to YWC, Inc. (YWC) for Priority Pollutant (PP) plus forty analysis and Princeton Testing Laboratory (PTL) for asbestos fiber counts. All sediment samples will be analyzed for YWC for PP plus forty parameters and PTL for asbestos fiber counts (see Table 2-2). The plus forty analysis will tentatively identify the 15 highest organic fraction peaks, the ten highest acid extractable organic fraction peaks, and the 15 highest base/neutral organic fraction peaks, along with their estimated concentrations using the EPA/NIH/NBS Mass Spectral library search.

Grab surface water samples will be taken in the Passaic River, Great Brook and Black Brook (see Table 2-1 and Figure 2-7). Background stations have been defined in the Passaic River upstream of the Millington Site. Samples will also be taken immediately downstream of each of the four sites. The water samples for PP plus forty analysis will be collected in clean YWC sample bottles, preserved according to the procedures provided by EPA and stored on ice immediately after sample collection. The water samples for asbestos fiber counts will be collected in clean sample bottles and stored on ice after sample collection.

In addition, two field replicates and one distilled water field blank will be collected and analyzed for PP plus forty parameters. Two field replicates and one distilled water field blank will be collected and analyzed for asbestos fiber counts. Prior to sampling, YWC will provide sampling personnel with laboratory-prepared distilled water for the field blanks. The field blanks will be subjected to the same sampling techniques as the surface water samples and will be submitted to YWC or PTL for analysis as blind samples. YWC will also provide three trip blanks (one for each sample shipment) for volatile organic analysis.

TABLE 2-1

PRELIMINARY SURFACE WATER AND
SEDIMENT SAMPLE NUMBERS AND LOCATIONS

Passaic River

- Above confluence with Great Brook (2)**
- Intersection with Lord Stirling Road (1)*
- Intersection with Maple Avenue (1)
- Immediately upstream of Millington Site (1)*
- Intersection with Haas Road (1)*
- Commonwealth Water Company intake (1)

Great Brook

- Upstream of disposal site (2)*
- Immediately downstream of disposal site (1)*
- Intersection with Pleasant Plains Road (1)
- Above confluence with Passaic River (1)*

Black Brook

- Upstream of White Bridge Road Site (2)*
- Immediately downstream of site (1)*
- Intersection with White Bridge Road (1)
- Above confluence with Passaic River (1)

Unnamed Tributary to Black Brook from New Vernon Road Area

- Upstream of the New Vernon Road Site (2)*
- Immediately downstream of the New Vernon Road Site (1)*

Unnamed Tributary to Black Brook from Long Hill Road Area

- Above confluence with Black Brook (1)*

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* Indicates sediment sample collection in addition to water sample collection.

** A sediment sample will be collected at the northernmost sampling location.

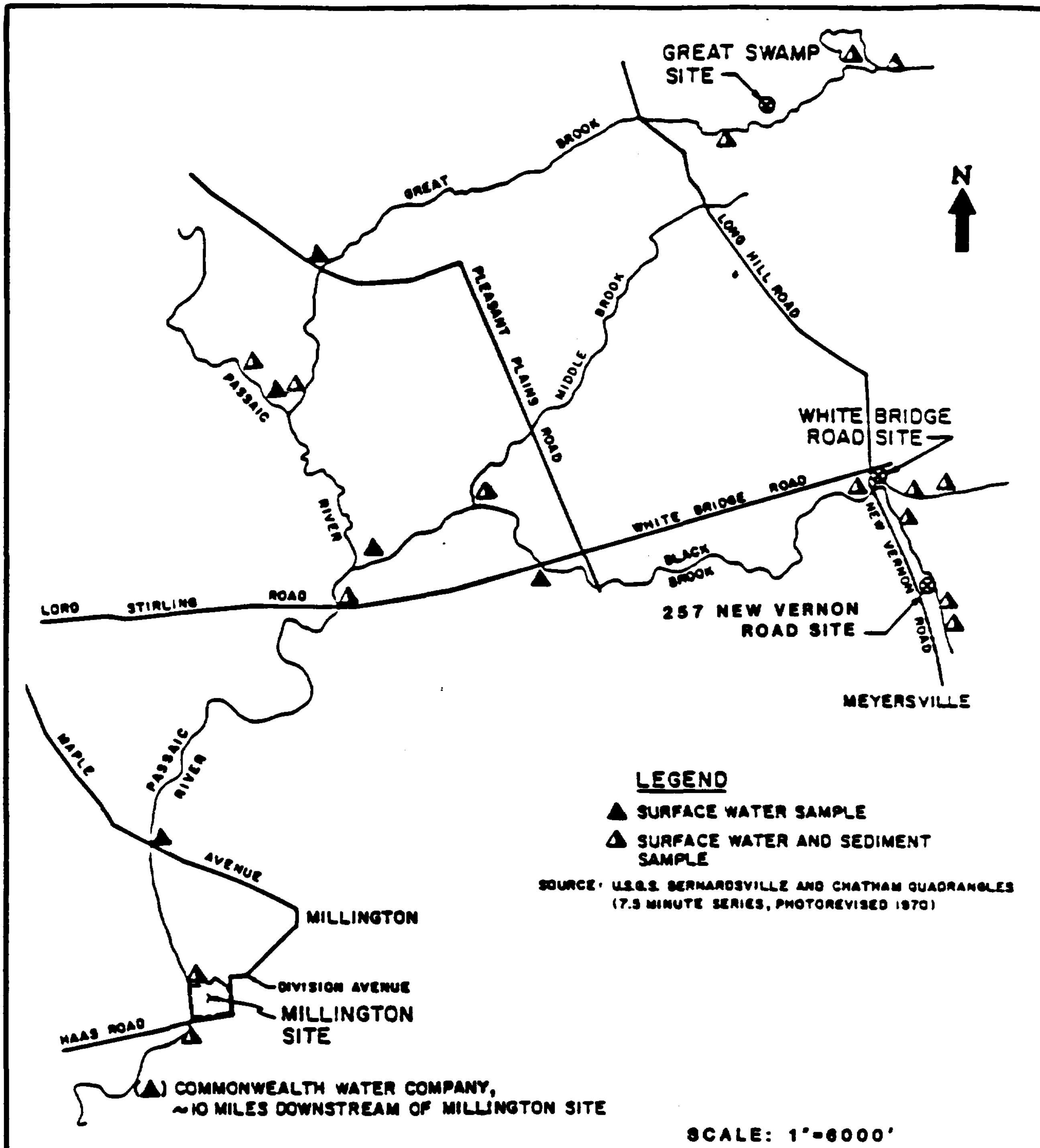

FIGURE 2-7

SURFACE WATER/SEDIMENT SAMPLE LOCATIONS

MILLINGTON AND SATELLITE SITES
MORRIS COUNTY, NJ

FRED C. HART ASSOCIATES, INC.

SOURCE: NUS CORPORATION

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TABLE 2-2

LABORATORY ANALYSES FOR MILLINGTON AND SATELLITE SITES

Matrix	No. of Samples**	Parameters	Laboratory	Field Replicates	Field Blanks	Trip Blanks***
Ambient Air	31	Asbestos Fiber Count	PTL	4	0	4
	5	Asbestos Fiber Count (TEM)	PTL	0	0	1
Surface Water	24	PP + 40 Parameters	YWC	2	1	0
	3	PP Volatile Organics	YWC	0	0	3
	24	Asbestos Fiber Count	PTL	2	1	0
Sediment	17	PP + 40 Parameters	YWC	1	1	0
	1	PP Volatile Organics	YWC	0	0	1
	16	Asbestos Fiber Count	PTL	1	0	0
Groundwater Monitoring Wells	27	PP + 40 Parameters	YWC	2	2	0
	3	PP Volatile Organics	YWC	0	0	3
	26	Asbestos Fiber Count	PTL	2	1	0
Potable Wells	12	PP + 40 Parameters	YWC	1	1	0
	1	PP Volatile Organics	YWC	0	0	1
	11	Asbestos Fiber Count	PTL	1	0	0
Subsurface Soil	46	PP + 40 Parameters	YWC	4	2	0
	2	PP Volatile Organics	YWC	0	0	2
	24	Engineering Properties	J&L	0	0	0

PP - Priority Pollutants

+40 - Analysis will tenatively identify the 15 highest volatile organic fraction peaks, 10 highest acid extractable organic fraction peaks and the 15 highest base/neutral organic fraction peaks, along with their estimated concentrations, using the EPA/NIH/NBS Mass Spectral library search.

** Includes QA samples.

*** Trip blanks will be sent with each shipment of volatile organic samples.

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Bottom sediment samples will be collected from the Passaic River, Great Brook, Black Brook and unnamed tributaries to Black Brook at the sampling locations listed in Table 2-1 and shown in Figure 2-4. The sediment sampling locations include background points upstream and points immediately downstream of the disposal sites. Sampling personnel will attempt to take sediment samples from the Passaic River at White Bridge Road and immediately upstream and downstream of the Millington Site. however, due to a documented lack of siltation of the Passaic River bed near the Millington Site, sediment samples may be difficult to obtain at these locations. Stream conditions will determine the precise sampling locations and, where possible, depositional area or areas along the bank will be preferentially sampled. Sediment samples will be taken at the bed or bank surface and, if possible, to a depth of six inches at each location. Where possible, the sediment samples will be collected with a stainless steel or brass coring device or a coring device with a removal Teflon or glass inner liner.

The sampling instruments will be cleaned prior to sampling by the laboratory and wrapped in heavy gauge aluminum foil for transport to the field. Equipment will be decontaminated between samples with Alconox detergent, rinsed with tap water, rinsed with distilled water, rinsed with solvent (methanol or acetone), rinsed with hexane and rinsed with deionized water. The sediment samples for PP plus forty analysis and asbestos fiber counts will be collected in laboratory-cleaned sample bottles provided by YWC and stored on ice immediately after sample collection.

In addition, one field replicate and one field blank will be collected. Replicate sediment samples, with the exception of samples for volatile organic analysis, will be collected by mixing sediment in a stainless steel bowl with a metal trowel and splitting the samples into two equal portions and then placing each portion into its respective containers. The replicate sample will be analyzed for PP plus forty parameters and asbestos fiber counts. Sampling personnel will prepare the field blank by pouring distilled water provided by YWC onto the sampling equipment and collecting the water in the appropriate sample bottles. The field blank will be submitted to YWC as a blind sample and analyzed for PP plus forty parameters. All surface water and sediment samples will be shipped to YWC or PTL in sample coolers under full chain-of-custody procedures. All sampling locations and field observations will be logged in bound field logbooks.

2.10.2 Ambient Air Sampling (Subtask 10.2)

During Task 8, Subsurface Investigations, a series of ambient air samples will be obtained and analyzed for asbestos fiber concentrations. Subsurface investigations will consist of soil boring, well installation and test pit operations, all of which are activities that could create airborne asbestos fibers if the activities create disturbances of asbestos-containing materials and soils. Since the remedial investigation team personnel will wear protective clothing and respirators until airborne asbestos levels are determined, any exposure of the personnel to asbestos fibers during this task will be mitigated. The primary objectives of the sampling task will be to identify whether significant amounts of asbestos fibers would be released during any excavation that might be undertaken during remedial actions and to predict the emission rate and air quality impact at the site boundary. Large-scale release of asbestos fibers could be a potential hazardous to off-site receptors, as well as to the personnel involved in the remedial actions. The results of the emission tests may indicate that emission control procedures such as wetting down the uncovered fill are necessary during excavation activities.

A total of 31 air samples for simple asbestos fiber counts will be taken at the four sites under investigation (Table 2-2). This number includes one sample per borehole for well installation plus one replicate and one trip blank at each of the four sites. Each sampler will be set up at the point at which the drill enters the soil. If a wind direction is detectable, the sample will be set up immediately downwind of the drill.

The samples will be obtained by drawing ambient air through a triacetate filter with a battery-powered air pump at a rate of approximately 1.5-2.0 lpm. The pumps will be calibrated prior to the start of each test and after the end of each test in order to obtain an average flow rate. Each test will run from two to eight hours, depending upon ambient dust levels. Since high dust loadings on the filters interfere with the asbestos fiber analyses, the total sample volumes will be restricted to about 200 liters if the conditions are extremely dusty.

The samples will be analyzed by PTL using NIOSH Method 239 for asbestos fiber concentrations. This method includes treating the filters with an oil dispersant fluid and counting the fibers using optical microscopy with phase-contrast illumination.

In addition, five (5) air samples will be collected during test pit operations at the Millington site. This number includes an upwind and downwind sample at each test pit and a trip blank. The samples will be placed 30 feet upwind and downwind of the center of the test pit at a point approximately four feet above ground. Wind direction will be determined by a wind direction indicator. The samples will be analyzed for PTL using transmission election microscopy (TEM). This method can distinguish between types of asbestos and differentiate between asbestos and other fibers.

The asbestos fiber concentrations will be used with estimates of meteorological parameters to determine emission rates during each drilling event. The pertinent meteorological parameters are wind speed and atmospheric stability, both of which will be estimated by recording sky conditions and/or consulting the nearest weather station. Using a Gaussian dispersion model, an emission rate range will be calculated. A ratio of the volume of excavated material to the volume of drilling spoils will be used with the emission rate from drilling to calculate the emission rate from a future excavation. The same Gaussian dispersion model will then be used to calculate air quality impacts resulting from the future excavation.

2.10.3 <u>Subsurface Soil/Asbestos Waste Sampling (Subtask 10.3)</u>

Subsurface soil and asbestos waste samples will be collected during Task 8, Subsurface Investigations, to define the extent of disposed material and contamination potential. In order to determine the full nature and extent of contamination at and emanating from the site, soil samples for chemical analysis will be selected randonly. The number and depth of soil samples for analysis will be determined in the field, through consultation with EPA staff or designated representatives. An estimated 40 subsurface soil samples will be selected for PP plus forty analysis by YWC. Based on collection of 40 soil samples, four replicates and two field blanks will be collected and analyzed for PP plus forty parameters. Two trip blanks (one with each sample shipment) for PP volatile organic analysis will accompany the soil samples to YWC. In addition, 24 Shelby tube samples will be taken and analyzed for engineering properties. The sampling procedures for both split-spoon and Shelby tube samples have been previously described in Section 2.8, Subsurface Investigations.

2.10.4 Groundwater Sampling (Subtask 10.4)

A total of 23 groundwater monitoring wells are expected to be installed at the four sites: seven wells at the Millington Site (Figure 2-1); ten at the Great Swamp Site; and three at each of the remaining two sites. On the initial sampling survey in Task 8, Subsurface Investigation, groundwater sampling will occur after adequate well development. Prior to sampling, the monitoring wells will be evacuated using a stainless steel bailer or submersible pump. If bailers are used, they will be certified as laboratory-clean and dedicated to each sampling point. A cord, consisting of teflon-coated wire, single strand stainless steel wire or chain, or polypropylene monofilament, will be attached to each bailer. To obtain representative samples, the wells will be evacuated at least three to five well volumes. Field measurements of specific conductance and pH will be measured for each well volume. If, after removal of three well volumes, the pH and conductance have not equilibrated, continued bailing or pumping will be necessary, provided that the well has sufficient capacity. If a submersible pump is used for evacuation, then three bailfuls of water will be used to rinse out the laboratory-cleaned sampling bailer prior to use at that well. In addition, a plastic cloth will be placed around the well to prevent contamination of the cord.

Field filtering of all groundwater samples for metals analysis will be conducted using disposable filter units with 0.45 micron filters. Prior to filtering, each filter unit will be triple rinsed with groundwater from the well being sampled to ensure that the unit is clean. Table 2-2 lists the number and type of analyses to be conducted during the initial groundwater sampling survey.

For quality assurance purposes, two replicates and two field blanks will be collected for PP plus forty analysis. Two replicates and one field blank will be taken for asbestos fiber counts. The field blanks will be prepared from laboratory distilled water provided by YWC and PTL. The field blanks will be subjected to the same sampling techniques as the groundwater samples and will be submitted to YWC or PTL as blind samples. Approximately three trip blanks (one with each sample shipment) for PP volatile organics will be provided and analyzed by YWC.

All groundwater samples for PP plus forty analysis and asbestos fiber counts will be placed in sample bottles prepared and provided by YWC, and stored on ice immediately after sample collection. All samples will be shipped for analysis to YWC or PTL in sample coolers under full chain-of-custody procedures.

2.10.5 Surface and Groundwater Monitoring (Subtask 10.5)

After the initial surface and groundwater sampling and analysis, two subsequent sampling surveys are anticipated as a part of Task 10, Environmental Sampling and Monitoring. The purpose of the monitoring program is to provide an adequate data base to evaluate the degree and extent of groundwater and surface water contamination. The nature of contamination will be determined from analyses of key indicator parameters from the PP scan based upon previous analytical results. A total of approximately 46 groundwater and 42 surface water samples at the locations described in Sections 2.10.1 and 2.10.4 are proposed. Sampling personnel will follow the sampling procedures described the sections listed above. The samples will be analyzed for indicator parameters along with field measurements of pH, conductivity, temperature and flow, where applicable.

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2.10.6 Potable Water Sampling (Subtask 10.6)

For the purpose of this work plan, approximately 10 potable well samples will be collected from homeowners in the vicinity of the White Bridge Road and New Vernon Road Sites. The exact number of samples taken will depend on the number of residents with potable water supplies near the sites. In addition, water from the Commonwealth Water Company (CWWC) intake on the Passaic River will be collected as part of the surface water sampling survey, Subtask 8.1.

Prior to sampling, the residences near the White Bridge Road and New Vernon Road Sites will be surveyed door-to-door for the presence of potable wells. The information HART personnel would like to obtain as a part of the survey is as follows:

- Precise location of well on property in relation to septic system.
- Well accessibility.
- Name of driller and date installed.
- Well depth.
- Well construction details.
- Pump type and setting.
- If access to well is a problem, is water pumped into a holding tank before household distribution and are any water treatment system used?

Once the above information is obtained, the precise location and method of sample collection can be decided. If the wells can be reached directly, an attempt will be made to remove at least three well volumes prior to sample collection. If the wells cannot be reached, and the home utilizes a holding tank or water treatment system, every attempt will be made to grab the sample before it enters the holding tank or is treated. If this is not possible, then several holding tank volumes will be evacuated prior to sample collection, and the treatment system used will be noted in the field book. When possible, aerating devices will be removed prior to sample collection. The samples will be placed directly from the tap or spigot into the laboratory-prepared sample bottles provided by YWC.

Aqueous volatile organic samples will be collected so that no headspace or air bubbles are left in the vials to prevent the loss of volatile compounds. Immediately following sample collection, samples will be stored on ice.

Table 2-2 lists the estimated number and type of samples to be collected during the potable well sampling survey. For quality assurance purposes, one replicate and one field blank for every 10 potable well samples will be collected. The replicate will be taken at random from one well and analyzed for PP plus forty parameters and asbestos fiber counts. The field blank will be prepared from laboratory-distilled water provided by YWC and subjected to the same sampling techniques as the potable well samples. The field blank will be analyzed for PP plus forty parameters. One trip blank will also be provided by YWC and analyzed for PP volatile organics.

All potable well samples for PP plus forty analysis will be carefully packed on ice at 4°C for shipment to YWC. Samples for asbestos fiber counts will be shipped to PTL on ice. Proper chain-of-custody procedures will be followed when transferring the samples from the field to the laboratories. In addition, accurate records will be kept of all sampling activity and will include the following information: date, time, location, sample number, method and length of water evacuation, and sampling techniques.

Analyses of all potable well samples will be for PP plus forty parameters at YWC and asbestos fiber counts at PTL. Based upon the initial sampling and hydrogeologic investigation results, EPA will determine the need for subsequent potable well sampling surveys.

2.11 <u>Aquatic Impact Assessment (Task 11)</u>

During the initial surface water and sediment sampling survey, benthic samples will be collected to further evaluate the potential impacts of the disposal sites on the receiving waters. Since some forms of the benthic community are highly susceptible to pollution, the presence or absence of certain species can be used to determine the trends in water quality. For this task, benthic macroinvertebrates will be examined in the field and the laboratory to assess the potential impacts of the four sites on the aquatic environment.

Benthic samples will be collected upstream and downstream of the four sites at each of the sediment sampling locations listed in Table 2-1. Where possible, a stream bottom sampler, such as a Surber Sampler, will be used. For soft bottoms, a ponar dredge or sediment corer will be used to collect a one liter sediment sample. In the Passaic River, sampling personnel will use a sweep net in addition to either a stream bottom sampler or dredge. The sweep net will be placed in a downstream location to collect aquatic forms dislodged from the substrate upstream of the net. At the time of collection, the sampling time, water characteristics such as depth and width, substrate description, flow velocity and sampler type will be recorded in the field notebook.

The dredge or corer samples will be sieved with a series of U.S. Standard meshed screens (Nos. 10,20,30,40,60 and 80) to extract the bentric samples. These sieve sizes will ensure that all organisms required for the impact assessment will be caught. Depending on the substrate, the samples will be sieved either by diluting the sample into a slurry and pouring the slurry through the sieves, or by placing the sample in the top sieve and flushing the sample through with water. Rocks, sticks and other artifacts in each sieve will be checked for clinging organisms before being discarded. The organisms on each screen will then be washed into a container designated to that sieve size and station number and stained with Rose Bengal before preserving with 10% formalin. This neutral stain is picked up by living organisms before being killed by formaldehyde, and therefore distinguishes which organisms were alive prior to preservation. All sample bottles will be labeled with location, date, type of sampler, name of collector, sample identification number, and sieve size and taken to Dr. Anita Freudenthal's office for further examination.

Dr. Freudenthal, a Marine Biologist, will identify the species present and examine whether substrates are being differentially colonized by specific types of organisms. She will consult life histories of the identified species to explain any differential colonization observed. Based on her review of the data, she will assess the impacts of the sites on the aquatic environment.

2.12 Data Reduction and Evaluation (Task 12)

Following applicable Remedial Investigation (RI) tasks, data generated during the study will be used in the production of a report which will be submitted following the completion of all RI tasks. The RI report will contain a thorough analysis and summary of all site activities so that a complete, coherent, and comprehensive understanding of site conditions is accomplished to support the Feasibility Study (FS).

The data from previous investigations will be re-evaluated within the context of the new data obtained during the RI to characterize the ground-water, surface water, sediment, and engineering properties of the in-situ soils and the asbestos processing spoil materials. Based on the results of the data evaluation, the stability of the Millington Site and the extent of contamination of the soils, surface water, sediments and ground-water in the vicinity of all the sites will be determined.

The significant contaminant pathways will be identified, and an assessment of the public health and environmental risks posed by the sites will be made. The degree to which either source control or off-site actions are required to mitigate any threat to public health, welfare or the environment will be identified. The risk assessment will be sufficiently detailed to determine whether further remedial response is required at that point.

2.13 Identify Preliminary Remedial Techniques (Task 13)

2.13.1 Establish Objectives and Criteria (Subtask 13.1)

The results of the Remedial Investigation will clarify the extent of contamination on the sites. Based on the extent of contamination, the objectives of site remediation will be established.

These objectives will be developed in conjunction with EPA and applicable regulatory agencies in New Jersey (i.e., NJDEP) and will include such objectives as the prevention of contaminant input into the environment and the mitigation of existing contamination. All objectives for site remediation will be consistent with the regulations set forth in the National Contingency Plan.

Criteria to be used in the evaluation of alternatives, such as technical, environmental, and economic factors, will be identified. The criteria for the evaluation of alternatives will include, at a minimum:

- Reliability
- Implementability
- Environmental Concern
- Safety Requirements
- Cost-Effectiveness

Factors implicit in the evaluation of remedial measures include: availability and cost of materials required for final construction; physical site limitations for construction activities; applicability of treatment technologies to the waste materials; long-term effectiveness of the remedial measure; long-term Operation and Maintenance (O&M) requirements; transportation requirements; and additional exposure hazards to the environment and public created by implementing a given remedial measure. All on-site and off-site remedial alternatives will be evaluated in comparison to a risk assessment associated with a no-action alternative. The contents of the risk assessment will include the items set forth in the consent order.

Based on site-specific conditions, some evaluation criteria may be weighted more heavily than others. The evaluation criteria will be reviewed and approved by the EPA.

2.13.2 Identify Remedial Technologies (Subtask 13 2)

Appropriate remedial technologies will be identified based on the established site objectives. These technologies will be evaluated singly and in combinations to determine how well they meet the established project objectives. One or more appropriate remedial technologies will be grouped together as required to constitute the remedial measure.

The identification process for remedial technologies will take into account the type of media contamination, the site-specific conditions (soils, geology, etc.), public health and safety concerns, and existing EPA and NJDEP hazardous waste and related regulations.

The remedial measures listed below represent a preliminary list of options based on the existing site information. The Millington Site will be examined with all of these options in mind, while the Great Swamp, White Bridge Road, and 257 New Vernon Road Sites will be examined based on selected options (see Table 2-3). Additional options will be examined for the latter sites, if additional contamination is found during the RI. The list will be reduced or expanded, depending on the results of the site investigation. For example, if surface and groundwater monitoring do not indicate chemical contamination on-site or off-site, groundwater collection and treatment will not be required. The final list of remedial measures to be considered for all sites will be subject to approval by EPA.

The remedial alternatives identified at this time include:

- <u>Removal and Proper Disposal of Contaminated Soil.</u> Excavating and disposing of the contaminated soil is one way to prevent additional leaching of contaminants into the groundwater and surface water. The extent of contamination and, therefore, the amount of soil to be removed will be determined in the RI. The soil removed from the site will have to be transported and disposed properly. Once the contaminated soil is removed, clean fill material will be placed in the excavated areas. The site will then be graded and revegetated.

- <u>Surface Capping</u> Surface capping is a remedial measure used to prevent surface water infiltration, control erosion, and isolate

TABLE 2-3
PRELIMINARY REMEDIAL TECHNOLOGIES
MILLINGTON AND SATELLITE SITES

Remedial Technology		Sites			
Category	Type	Millington Dump	Great Swamp	White Bridge Road	257 New Vernon Road
	Removal & proper disposal of contaminated soil & fill.	X	X	X	X
Engineering	Surface capping	X(1)	X	X(3)	X
	Stormwater controls	X			
	Surface grading & revegetation	X	X	X	X
	Erosion protection	X			
	Surface & slope				
	Recontouring & benching	X			
	Retaining	X			
	Leachate collection & treatment	X			
	Stormwater collection & treatment	X			
Treatment	Groundwater collection & treatment	X			
	Construction of groundwater barriers	X			
	Surface water collection & treatment	X			
Other	No action	X	X	X	X

(1) Surface capping will not be considered appropriate by itself as a remedial measure at the Millington site. It will be considered in conjunction with or in addition to recontouring, benching installing or retaining walls or cabions or other slope stabilization techniques as appropriate.

(2) Potential for treatment at secondary dump sites will be contingent upon whether toxics are found in the groundwater during the RI.

(3) Surface capping at White Bridge Road Site may include rototilling cement and water into quarry blend or borrow materials over base soil areas to fix asbestos fill materials in place.

Source: Prepared by Fred C. Hart Associates.
(0260A)

and contain contaminated wastes and volatiles. Natural materials, such as clay or silt, or synthetic liners constructed of materials such as PVC, butyl, or hypalon, may be used. Other surface capping techniques which may be considered in this project would include remedial measures such as rototilling cement and water into surface soils or borrow sources over base soil areas to fix asbestos fill materials in place.

- The choice of sealing material and method of application is dictated by site-specific factors, such as local availability and costs of cover material, the nature of the wastes being covered, local climate and hydrogeology, and projected future use of the site.

- The subject of location and types of borrow material required and available to implement this option are not addressed in this work plan. If this option is selected for further consideration, a modification must be made to the work plan to accommodate the locating, sampling and laboratory testing of suitable borrow material.

- Due to the nature and location of the asbestos hill at the Millington Site, this option will not be considered adequate without moderation of the existing outslopes.

- <u>Stormwater Controls</u>. Stormwater controls consist of surface grading (terracing, channeling or construction of ditches) and/or drainage collection facilities including storm drains, catch basins and outfalls. Stormwater controls also promote surface runoff by reducing infiltration and leachate generation, while enhancing the stability of surface cap, landforms, and other site improvements by minimizing erosion. Stormwater controls are most applicable to the north and south portions of the asbestos hill which may require stormwater collection facilities to handle runoff from steep side slopes (greater than 40 feet).

- Surface Grading and Revegetation. Surface grading is used to reshape the surface of covered landfills in order to manage surface water infiltration and erosion. The choice of specific grading techniques for a given waste disposal site will depend on site conditions. A graded surface indirectly controls ground-water contamination by promoting surface runoff and reducing infiltration, therefore minimizing leachate generation. Re-vegetation is used to dry surface layers of land disposal areas through root uptake/evapotranspiration, reducing the volume of leachate generated and, thereby, indirectly controlling ground-water contamination.

- Erosion Control. At present, the riprap at the toe of the slope at the Millington Site is insufficient to protect the asbestos pile from erosion and sloughing during a medium-to-high flood.

- Erosion control systems will be examined in an effort to protect the slope from damage. Additional riprap, geotextiles, concrete mats, gabions and other systems will be considered to prevent erosion, scouring, and undercutting of the slope. The system will be designed after a review of projected flooding in the Passaic River.

- Surface and Slope Recontouring and Benching. This remedial action would provide a method to stabilize the embankment by reducing the overall angle of the slope. The slope would be designed based upon the engineering properties of the pile and the in-situ soils.

- Retaining Structures. This alternative would provide stability to the pile through the application of a structure resistant to the movements of the slope. Concrete retaining walls, crib walls, gabions, and other methods will be examined as buttressing alter-natives for the pile.

- Leachate Collection and Treatment. Leachate collection systems consist of a series of drains that intercept contaminated liquid discharged from the site and channel it to a treatment facility or discharge point. Leachate treatment will be highly variable depending on the composition and strength of the leachate.

- Groundwater Collection and Treatment. Groundwater collection and treatment is achieved by installing recovery wells that pump groundwater from the contaminated aquifers, treating the water and returning it to the aquifer or discharging to either surface waters or POTW. As with all methods that affect groundwater conditions, extensive investigation and treatability studies are necessary to determine the appropriate implementation procedures. Surface water or POTW discharge (NJDPES) permits must also be obtained if necessary.

- Construction Groundwater Barriers. Groundwater barriers, constructed of bentonite slurries, cement or chemical grout, or sheet piling, can be installed vertically to (1) prevent groundwater from migrating away from the site or (2) divert groundwater so that contact with waste materials is prevented. The installation of an impermeable barrier to control groundwater flow may cause an increase in the upgradient hydraulic head, which would affect the rate of movement of groundwater. These effects must be investigated before recommendation of a groundwater barrier.

- Surface Water Collection and Treatment. Surface water collection and treatment involves collecting surface waters originating from the site and treating them on-site in sedimentation ponds connected to site drainage facilities for surface water or POTW discharge. Treatability studies must precede implementation of any surface water treatment scheme. POTW or surface water discharge will also require (NJDPES) permits.

No Action. In all cases, as dictated by the NCP, the "no action" alternative must be considered in cost-effective analysis. The analysis must address both the environmental and financial consequences of such an alternative.

2.14 Prepare Remedial Investigation Report (Task 14)

After completion of the field investigations, all pertinent field and laboratory data will be assembled into a detailed report of the Remedial Investigation. Maps, figures, and tables will be prepared to support the text. This report will include detailed descriptions of the following items:

- Objectives of the Remedial Investigation.
- A description of the study area, including soil types and depths, and the results of the laboratory testing.
- A description of the surficial and subsurface geologic conditions in the vicinity of the sites.
- Hydrogeologic conditions at and in the immediate vicinity of the sites, including the depth of the aquifers and the rates and directions of groundwater flow.
- Groundwater and surface water quality in the study areas.
- Ambient air quality to determine public health risk.
- Transport of the waste by surface water in the vicinity of the sites.
- Extent of contaminated groundwater plumes with estimates of the flow time from the source to the aquifer (if possible), if such plumes are found during the RI at the Millington or the satellite sites.

- The stability of the asbestos by-products and spoil pile at the Millington site.

- Supporting data, such as chemical analysis reports, logs, and monitoring well water level readings.

- Conclusions and recommendations of the study.

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3.0 Project Organization

The following is the project organization for the Remedial Investigation of the Millington, Great Swamp, 257 New Vernon Road, and White Bridge Road Sites in Morris County, New Jersey. Figure 3-1 shows the project organization.

3.1 Project Management

The following HART personnel have been designated as remedial investigation team members for this project:

Name	Responsibility	Level of effort (man-hours)
Raymond Kane, P.E.	Project Director	40
Gary Brown, P.E.	Technical Reviewer/Engineering	52
Thomas Morahan	Project Manager	584
Frances Barker	Field Team Leader/ Quality Assurance Officer/Site Safety Officer	830
Bruce Mackie	Hydrogeologist/Ground-water Sampling	1129
John Iannone	Engineering	206
Loretta Hoglund	Biologist/Surface Water, Sediment, Biota Sampling	256
Jose Vega	Field Technician/Groundwater Sampling	860

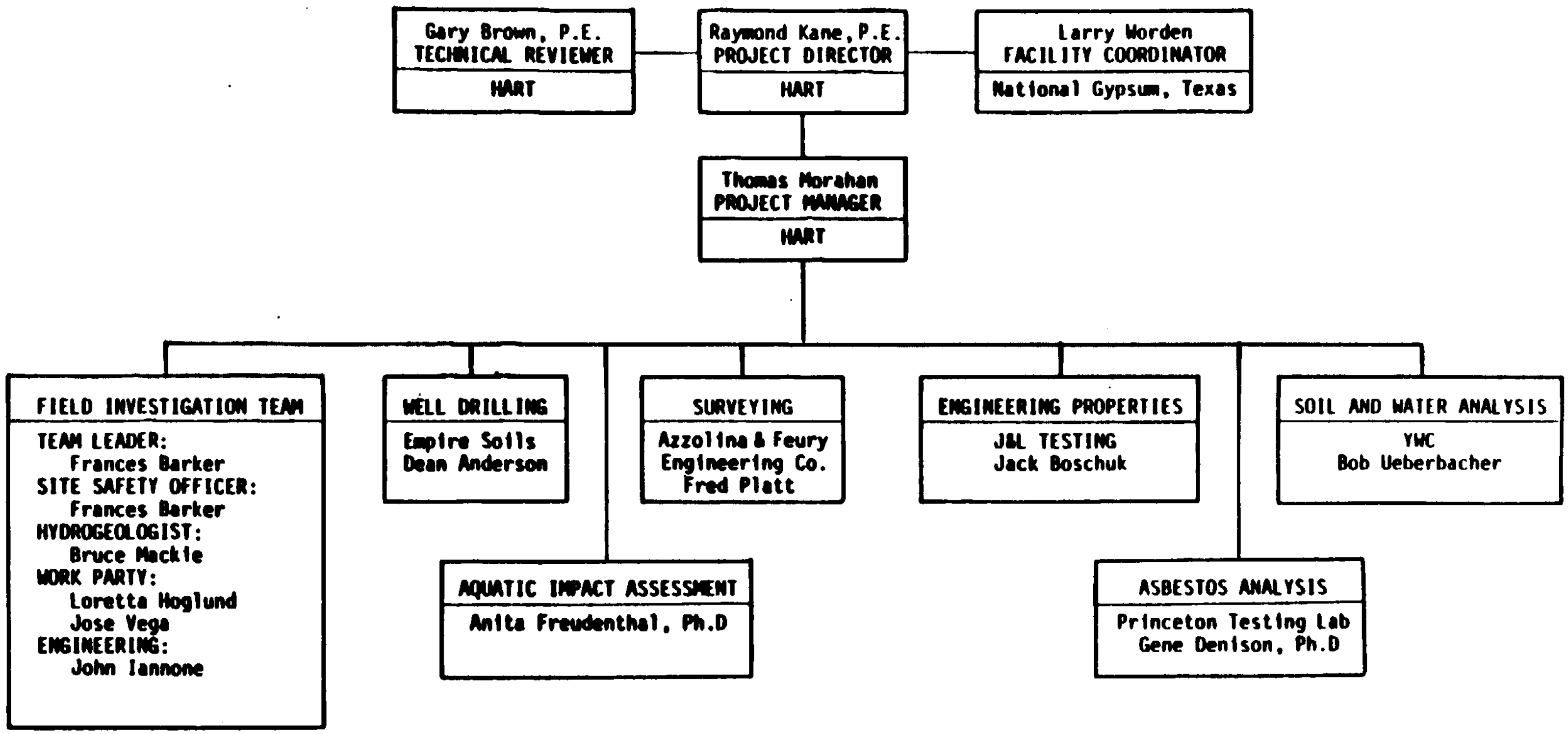
3.2 Resumes

The resumes which follow are provided for the above personnel.

ASB 001 1471

FIGURE 3-1

PROJECT ORGANIZATION CHART
MILLINGTON AND SATELLITE SITES RI/FS



Frances B. Barker

Fields of Competence

Hazardous waste site investigation; environmental sampling and measurement techniques; field data collection and quality assurance procedures; risk assessments.

Experience Summary

Over four years of experience in hazardous waste site investigation including development and implementation of sampling programs, assessment of potential risks to public health and the environment, participation in remedial investigation/feasibility studies at Superfund sites.

Education

B.A., Biology - Colorado College, 1980

Key Projects

- Quality Assurance/Quality Control (QA/QC) Officer for a Remedial Investigation of a Superfund site in Kansas City, Missouri. Responsibilities included preparing the QA/QC Plan, supervising on-site chain-of-custody and quality assurance procedures, performing audits of the sampling teams and evaluaiing the QA/QC procedures used at the site.

- Prepared QA/QC procedures and laboratory cost estimates for a detailed groundwater monitoring program at a Superfund site in Connecticut. Reviewed dioxin sampling and analytical methodologies.

- Performed literature search on the health effects of Dioxin for a major air toxics risk assessment.

- Implemented an ambient air monitoring program at a Superfund site. Evaluated fugitive emissions from several hazardous waste sites.

- Supervised potable well sampling activities at two Superfund sites.

- Participated in a Remedial Investigation at a designated Superfund site in Pennsylvania. Assisted the Site Safety Officer during well installation, sampling of groundwater monitoring wells and assessing impacts of contaminants on public health and the environment

ASB 001 1473

- Prepared a regulatory summarry which outlined the major environmental laws and regulations 'ncluding RCRA, TSCA, OSHA and State "Right-To-Know" laws for a large mass transportion agency. Developed a hazardous wasie regulatory compliance plan detailing tne required permit, manifest, contingency, inspection, and waste analysis plans.

- Participated in two environmental assessments of U.S. Naval bases, to determine the impacts of past disposal practices. Conducted records searches, performed site investigations and described biological features.

- Prepared Remedial Action Master Plans (RAMPs) for several Superfund sites in New Jersey. Collected background data, assessed the potential public health effects of tne site and analyzed the adequacy of the existing data bases.

- Field technician for EPA Region 11 Field Investigation Team. Responsible for background data collection, preliminary assessment, sampling, priority pollutant data analysis and report preparation. Completed forty field investigations and sampled thirty sites.

Gary R. Brown, P.E.

Registration

Registered Professional Engineer in the states of New Jersey, New York and Pennsylvania.

Fields of Competence

Project and construction management; facilities engineering and engineering management; solid, hazardous waste and wastewater engineering; acquisition evaluations; siting and feasibility studies, regulatory and legal liaison; permit acquisition; multi-disciplinary troubleshooting; and expert witness testimony.

Experience Summary

Over twelve years of diversified engineering experience including eight years of management experience. Work has included concept development, permitting, design and construction of hazardous and solid waste and wastewater management projects, including complex upgrading and expansion projects. Technical achievements include implementation of state-of-the-art improvements at environmental management facilities in the public and private sectors. He has served as project engineer or management on projects with multi-million dollar construction costs, involving complex permitting and multiple technical disciplines, including work on projects where upgrading had to occur while ongoing facility operations had to be maintained uninterrupted.

Education

B.S. Environmental Engineering - Syracuse University
Additional coursework: Management, Supervision, Hydrogeology and Data Processing.

Key Projects

- Project Manager for design of a wood gas to energy project in Newburgh, NY. Work included the design of truck unloading and solid fuel storage systems, design of mezzanine structures and foundations in close proximity to operating equipment, investigation and design of utility systems and tie-ins, as well as construction phase assistance and preparation of as-built plans. Utility system tie-ins included electrical, water, storm drain, fire sprinkler/alarm, steam, oil, boiler refitting/rewiring and complex control/instrumentation interfacing of vendor-supplied control panels.

(0004R)

- Engineering manager for a multi-million dollar project involving upgrading of a major landfill in eastern Pennsylvania. Work included Part B Application preparation, upgrading and closeout of hazardous waste landfill section, leachate treatment plant upgrading and design and permitting of landfill expansions. Responsible for engineering budget of over $1 million. Work included upgrading of all active site utility systems and upgrading of hazardous waste treatment process without process interruption. Work was completed on schedule and within budget, even given stringent consent agreement deadlines.

- Engineering manager for formulation of remedial and upgrading plans at a major midwest liquid hazardous waste management facility. Work included preparation of lagoon closure and PCB cleanup plans and design, permitting and construction of a major new tank-based treatment and storage facility.

- Expert witness in federal court on a case involving leachate discharges from a sanitary landfill.

- Project manager for a northern New Jersey project involving construction of the world's largest solid waste baling facility. Work included design aspects and operations and maintenance manual preparation, as well as construction management during the project closeout phase.

- Engineering manager for a New York landfill upgrading and expansion project involving resolution of complex permitting delays.

- Group leader or participant on projects involving wastewater treatment and collection systems troubleshooting, odor control investigations and preparation of comprehensive operations and maintenance manuals for large plants.

- Development of computerized reporting systems for reporting of major project's budget, status, scheduling and cost control for construction contracts and consultants.

- Transition engineering manager responsible for successful transfer of permitting, design and environmental management information for over 50 facilities as a result of a Fortune 500 service company major acquisition. Work included debriefing of management employees, transfer of sensitive information and preparation of comprehensive environmental management summary documents for all facilities. Logistical information transfer was also supervised.

- Completion of acquisition feasibility studies for numerous multimillion dollar facility purchases, including itemization and quantification of short and long term liabilities and analysis of profitability potentials.

Professional Affiliations

American Society of Civil Engineers
Air Pollution Control Association
Water Resources Association of the Delaware River Basin
American Society for Testing and Materials, Disposal Committee

Publications and Addresses

"Landfilling Technology," presented at Seminar on the Solid Waste Crisis in the Delaware Valley, January 22, 1985.

"Landfilling Technology in New Jersey: Short and Long Term Impact on Leachate Discharge," NJ Water Pollution Control Association Seminar, September 22, 1981.

"Bioconversion - Gasification of Combined Municipal Solid Waste and Sewage Sludge," NJ Water Pollution Control Association Seminar, March 21, 1979.

"Review of State-of-the-Art for Landfills," American Society of Civil Engineers Seminar, March 14, 1978.

Loretta E. Hoglund

Fields of Competence

Field investigations for wildlife and resource inventories; data analysis for and preparation of environmental impact statements and Part B permit applications; field data collection, quantitative assessment and interpretation of air quality and water quality data; preparation of environmental permit applications.

Experience Summary

Four years experience preparing environmental impact statements and assessments including field investigation and data analysis with special emphasis on the areas of air quality, water quality and wetlands assessments.

Education

B.S., Russell Sage College, Biology, 1979.
M.S., Long Island University, Environmental Science, 1983.

Key Projects

- Prepared Part B Permit Applications for several hazardous waste facilities. These facilities conducted treatment, stabilization, storage and land disposal of hazardous waste materials.

- Maintenance of air monitoring stations for SO_2, NO_2 and total suspended particulates, interpretation and quantitative assessment of the resultant data.

- Instituted a dust monitoring program, in conjunction with EPA, to determine the effectiveness of various chemicals on differing road carpets in controlling fugitive dust.

- Conducted in surface water and air sampling programs as part of modelling effort to establish waste load allocations in a tidal estuary.

- Collaborated in the preparation of an oil spill contingency manual for Hempstead Harbor, identifying sensitive habitats and developing methods to minimize pollution effects.

- Conducted analysis and prepared Freshwater and Tidal Wetlands permit applications for submission to the New York State Department of Environmental Conservation.

- Prepared Environmental Impact Statements dealing with primary issues such as wetlands, endangered wildlife habitats, traffic impacts and zoning changes.
- Involved in the preparation of hazardous waste risk assessment studies.

John J. Iannone

Registration

Professional Engineer in the States of New York and Connecticut.

Fields of Competence

Concept and final design of industrial and municipal wastewater treatment systems; remedial investigations and feasibility studies for hazardous wastes; industrial pre-treatment program development and compliance; environmental impact statements; and construction management of highway and sewer projects.

Experience Summary

Over eight years of planning, design and construction management experience on major civil and environmental projects. Six years of experience in planning and design of wastewater treatment facilities and hazardous waste site rehabilitation projects. Two years construction management experience, including on-site inspection and assistant resident duties, office support and administrative duties on sewer construction and highway rehabilitation projects. Directed and coordinated technical staffs, supervised personnel, oversaw meeting budgetary and scheduling constraints, client contact, business development and fulfilling contract requirements.

Education

B.E., Civil Engineering - Manhattan College, 1971
M.S., Civil Engineering - Polytechnic Institute of NY, 1980
Certificate, USEPA course "Protecting Hazardous Material Response Personnel," 1984
Certificate, Computer Programming and Systems Analysis - New York University, 1984.

Key Projects

- Project Management for the design of piping and treatment systems for a hazardous waste facility in Nassau County, New York.

- Construction Manager, start-up tasks for a NYSDOT construction project, Long Island Expressway, Queens, New York. Presided over project opening tasks, including integrating NYSDOT requirements and contractor limitations into project schedule and negotiating engineering support tasks.

- Project Manager for the preparation of final contract drawings and specifications erosion control measures at a dioxin-contaminated military site in Florida.

- Project Engineer for the design of reconstruction work for a sewer system and seven million gallon per day wastewater treatment plant.

- Office Engineer/Assistant Resident Engineer on a ten million dollar highway and bridge reconstruction project. Functions included inspection of utility installation (electric, traffic signals and police communications), supervision of structural and paving inspectors, maintaining quality control procedures and project cost accounting.

- Project Engineer for a two-year study to establish an industrial pre-treatment program controlling entry of toxic industrial waste into New York City's public sewer system. Determined impacts to twelve City treatment plants and to the environment from 1.5 billion gallons of municipal and industrial wastewater discharged daily.

- Project Engineer for a major survey to identify industrial waste sources in New York City and to determine the quantity of hazardous waste they generate.

- Team Leader for the New York City Infrastructure Review Project. Supervised one of the four teams of engineers and technicians in assessing the capability of the City's Department of Environmental protection to operate as an independent authority.

- Project Engineer, concept design of a US Corps of Engineers' electroplating facility and hazardous (heavy metal) waste landfill.

- Project Engineer for a low-level radioactive waste site remedial action plan. Studied runoff patterns, flooding potential, water quality impacts and the effects of mitigating actions.

- Project Engineer for a USEPA study of Rotating Biological Contactor (RBC) technology, including: evaluating modeling techniques to predict system performance; comparing manufacturers' design curves to observed performance; and conducting a metering program to quantity power usage.

- Project Engineer for a U.S. Department of Energy study to assess the effects of RCRA on emerging coal combustion and coal conversion technologies. Characterized chemical constituents of solid and liquid waste streams from process and pollution control activities, identified public and worker health concerns and estimated the cost of solid waste disposal alternatives.

- Project Engineer for study to develop a user charge system to recover capital and operation and maintenance costs for a ten million gallon per day municipal wastewater treatment plant.

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- Project Engineer for study to determine potential water quality effects and downstream flooding for a proposed expansion of the Bell Laboratory facilities in Holmdel, NJ.

Professional Affiliations

Water Pollution Control Federation
WPCA Environmental Science Committee

Publications

"Organic Priority Pollutants in New York City Wastewater, Their Sources and Impacts", J. Iannone and M. Pai; Industrial Wastes Symposium, 57th CF Conference; October 1984.

"Current Status of the New York City Industrial Pre-treatment Program," R. Adamski, L. Klein, J. Iannone and S. Bassell; New York Water Pollution Control Association; January 1983.

"An Assessment of Dissolved Oxygen Limitations and Interstage Design in RBC Systems", W. Chesner and J. Iannone; First International Conference on Fixed Film Biological Processes. University of Pittsburgh and USEPA, Cincinnati, Ohio., April 1982.

"Environmental Aspects of Solid Waste Management in Synthetic Fuel from Coal Facilities," W. Chesner, J. Iannone and M. Pai; 54th WPCF Conference; October 1981.

"Current Status of Municipal Wastewater Treatment with RBC Technology in the United States," W. Chesner and J. Iannone. First National Symposium on RBC Technology, University of Pittsburgh; February 1980.

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Raymond W. Kane, P.E.

Registration

Registered Professional Engineer in Pennsylvania.

Fields of Competence

Environmental management and regulatory compliance; hazardous/toxic waste management siting; regional planning; socioeconomic and institutional analysis; water resource planning; environmental impact assessment; management consulting; strategic planning and risk assessment.

Experience Summary

Fourteen years in a variety of energy/environmental projects for large and small industrial firms, and Federal and State government clients. Manager of large, complex, interdisciplinary studies for petroleum and chemical industries. Program manager for statewide power plant siting study. Conducted over 100 environmental audits and regulatory compliance reviews at industrial facilities. Developed comprehensive environmental audit programs for NIH and U.S. Air Force. Groundwater remediation operations management for large chemical company. Conducted several water resource planning and economic base studies.

Education

B.S. Civil Engineering - Villanova University, 1967.
M.S. Civil Engineering - Villanova University, 1976.

Key Projects

- Project manager for environmental audit and regulatory compliance review for Occidental Petroleum Corporation. Conducted reviews of over 100 chemical, petroleum, and coal preparation facilities. Determined true costs of environmental compliance activities and corporate liability for three-year period in response to an SEC consent agreement. As a follow-up, also developed an Assessment Program Guidance Document (APGD) to help corporate staff set up programs, policies, and procedures to ensure environmentally related liabilities and exposure are minimized.

- Developed agency-wide Environmental Audit Program for the National Institute of Health. Prepared a tailored audit manual including protocols to audit multi-media compliance areas.

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- Developed comprehensive Environmental Audit Program for U.S. Air Force. Audited over 20 Air Force installations and prepared an audit manual to be used by installations.

- Project manager for groundwater remediation program for pesticide contaminated site for large chemical company. Responsible for operation and maintenance of carbon adsorption treatment facility, recovery wells, and injection wells. Also responsible for analytical lab and processing of samples from wells and treatment facility plant. Effluent treatment was required to be no greater that 1 ppb. Project was part of Consent Agreement between EPA, State, and large chemical company.

- Project manager for risk assessments at five previously contaminated Superfund sites. Investigated all previous activities through record searches and interviews to determine nature and extent of contamination using empirical models determining environmental exposures, migration pathways, and overall risk factors. Made recommendations for further analysis and clean-up as appropriate.

- Project manager for coal-fired power plant siting study in Western Maryland. Served as program integrator, managing the technical work of several subcontractors. Identified exclusionary and discretionary screening criteria and determined best sites for siting of power plant using state MAGI (environmental data base) system. Participated in Public Involvement Program through public workshops and meetings. Resevoir siting and coal cleaning facility siting studies were also a part of this large complex project.

- Project manager for large oil, gas, and shale technology R&D project for Department of Energy. Conducted a variety of technical resource characterization studies, market studies, strategic planning, and environmental assessment evaluations for DOE program offices. Technologies evaluated included aboveground and modified in-situ oil shale retorting, enhanced oil recovery and enhanced gas recovery. Coordination with Bartellsville Energy Technology Center (BETC) staff was a major part of this project.

- Project manager, New York City Department of Environmental Protection. Responsible for environmental assessment of city-wide sludge management facility plan. Work included site selection criteria and screening and development of baseline information and impact assessments for a range of landbased alternatives including compositing, land application, co-incineration, co-disposal, and landfilling.

- Project manager, Pennsylvania Department of Transportation. Responsibilities included regional planning and development of an EIS for 17 miles of a four-lane interstate highway project and coordination of all study elements. Public participation and client relations were prime management responsibilities, in addition to the technical responsibility for water resources assessment.

- Project manager, Confidential Industrial Client. Determination of potential development constraints for expansion of facilities involving investigations of: 1) zoning regulations, 2) municipal services, 3) environmental constraints, and 4) traffic transportation constraints.

- Project manager, Vicksburg District Corps of Engineers. Responsible for the coordination and management of study geared to the projection of population, employment earnings, value added, income, industrial growth, and agricultural production for a 25-county region in northwest Mississippi.

Professional Affiliations

Water Pollution Control Association
Air Pollution Control Association
American Management Association
Society of American Military Engineers
Tau Beta Pi

Publications

"Water Resources Impacts of Synthetic Fuels Development in the West," Villanova University, 1981.

"What Constitutes a Good Corporate Environmental Management and Regulatory Compliance Program?" Environmental Forum, June 1982, Washington, DC.

Environmental Audits, 4the Editon Government Institutes Inc., Rockville, MD, 1985.

"Common Problems Found During Hazardous Materials Audits," The 3rd Annual Hazardous Materials Management Conference, June 1985, Philadelphia, PA.

"DOD's Superfund Program," Environmental Forum, October 1983, Washington, DC, Volume 2.

Bruce E. Mackie

Fields of Competence

Groundwater monitoring and investigation, well design and installation, land reclamation, geophysical investigation, well logging and gas chromatograph analysis.

Experience Summary

Five years varied geologic and hydrogeologic experience, including well-site geology involving lithoigic identification, hydrocarbon evaluation and geophysical analysis, hydrogeologic evaluation of municipal sanitary landfills, evaluation of abandoned mine lands for compliance with federal and state mining laws and supervision of hydrogeologic field investigations and groundwater monitoring at numerous N.P.L. sites.

Education

B.A., Geology - Susquehanna University, 1978
M.S. Candidate - Hydrogeology, Susquehana University

Key Projects

- Project Manager for statewide abandoned mine lands inventory in Pennsylvania, including mine drainage analysis, identification of health and safety hazards, compliance monitoring and reclamation studies involving reclamation alternatives and cost-benefit analysis.

- Design of maintenance and monitoring contingency plans for hazardous waste landfill to comply with RCRA regulations for PCB storage.

- Field Leader of feasibility study for municipal sanitary landfill involving field analysis of geologic and hydrogeologic condition, receptor impact and compliance with NJPDES permit regulations.

- Investigation of industrial solvent spill involving determining extent of contamination, implementing monitoring systems and instituting recovery programs. Supervision of three month hdyrogeologic investigation including simultaneous use of four drilling rigs.

- Well-site geologist for ten petroleum exploration wells involving lithologic identification, stratigraphic correlation, core analysis, gas chromatograph evaluation, selection of packer seats and core sampling locations and Electric Log geophysical investigation.

- Field supervision of quarterly groundwater sampling programs for priority pollutants at both Superfund and non-hazardous waste sites.

- Preparation of work plans and site operations plans for Superfund sites in Missouri, Michigan and New Jersey.

- Monitoring of EPA Region III Field Investigation Team (FIT) at Pennsylvania Superfund site for compliance with safety and sampling protocols.

- Field experience includes site investigation work under USEPA Levels B, C, and D.

Thomas J. Morahan

Fields of Competence

Hydrogeologic analysis and management with an emphasis on geochemistry, including surface and borehole geophysics, groundwater monitoring programs, aquifer testing and modeling, analyses of two phase flow, geochemical analysis of contaminant dispersion, geologic mapping, photogeologic interpretation and site safety.

Experience Summary

Four years of varied water resources management experience pertaining to hazardous waste, including the design, implementation and management of initial remedial measures, remedial investigation and feasibility studies at over 30 National Priority List sites. Other work includes CERCLA, RCRA and NCP compliance, environmental audits and design of on-site treatment systems.

Education

BA Geology/Chemistry - Rutgers University, 1979
MS Geology - Sul Ross State University, 1981

Key Projects

- Provided technical support to a PRP Committee of large industrial clients at a politically sensitive Superfund Site in the northeast. Helped negotiate a consent order agreement for remedial action.

- Managed a full scale hydrogeologic investigation of a major sanitary landfill Superfund Site. Included aquifer testing, geochemical modeling of leachate plumes, risk assessment and feasibility studies. Also provided technical assistance to bring the client into compliance with State Pollutant Discharge Elimination System Requirements.

- Provided investigative and geotechnical support at a designated Superfund site in Pennsylvania. Implemented a thorough groundwater assessment plan including the establishment of permanent upgradient and downgradient monitoring points. Initiated a comprehensive groundwater plan to determine the nature and extent of groundwater contamination.

- Assisted in a study of hazardous materials management for a major urban transit authority. Investigated subway and train yards, bus depot and maintenance shops. Developed a comprehensive management plan for hazardous materials utilized by the facility, hazardous waste generated and appropriate management procedures and steps required to achieve regulatory compliance.

- Performed various geotechnical investigations at a hazardous waste disposal site in Maryland owned by a major waste disposal corporation. These included seismic refraction and reflection, surface electrical resistivity surveys, natural gamma logging and computer simulation of leachate generation.
- As a member of the USEPA Region II Field Investigation Team, conducted preliminary and full scale field investigations at 40 uncontrolled hazardous waste sites. Studies included test boring and monitor well installation, aquifer pump tests, two phase flow problems, well development and abandonment programs, sampling programs and geochemical definition of leachate plumes.
- Developed site safety protocols for hazardous waste sites and assisted in the development of leachate treatment systems.

Professional Affiliations

National Well Water Association
American Association of Petroleum Geologists
Texas Academy of Science

Publications and Presentations

Effects of Coal Mining in Evaluating Risks at Pennsylvania #4 Superfund Site in The Proceedings of the Hazardous Materials Management Conference, June 1985.

Session Moderator - Contaminant Plume Characterization, National Water Well Association Fifth National Symposium on Aquifer Restoration and Groundwater Monitoring, May 1985.

Geologic Considerations in the Design of Monitoring Networks: Fractured, Porous and Unconsolidated Porous Media (with R.C. Dorrler and J.P. Mack) at the National Water Well Associations Fifth National Symposium Aquifer Restoration and Groundwater Contamination, May 1985.

The Application of Borehole TV Cameras to Groundwater Monitoring Programs (with R.C. Dorrler) in Groundwater Monitoring Review, V.4, No. 4, Fall 1984.

Site Security and Waste Removal Activities At An Abandoned Hazardous Waste Site (with M.A. Barbara and R.W. Teets) in Management of Uncontrolled Hazardous Waste Sites. 1983.

Development of a Broad Coverage Contract of Monitor Well Installations at Hazardous Waste Sites, in Impact of RCRA on the Petrochemical Industry, American Institute of Chemical Engineering, 1983.

Groundwater Transport of Mercury, Texas Academy of Sciences Annual Meeting, San Angelo, TX, 1982.

Mercury Transport in the Terlingua, Texas, Mercury Mining District. American Chemical Society, Permian Basin Section Research Conference, 1979.

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Jose Luis Vega

Field Technician/Draftsman

Jose Luis Vega is a Field Technician and Draftsman with over four years experience at Fred C. Hart Associates, Inc. As a former member of the Region II Field Investigation Team, Mr. Vega has assisted in the investigations of over 20 hazardous waste sites, including 5 designated Superfund sites. He has sampled soil, sediment, biota, and surface water for potential contamination. He has conducted priority pollutant and EP toxicity studies. He is experienced in the use of Self-Contained Breathing Appartus (SCBA) and trained in precautionary sampling measures.

Mr. Vega also assists in the graphics department, creating paste-ups, layouts, and illustrations. He devises formats for charts, maps, proposals, and publications used by the firm.

Mr. Vega holds a drafting degree, has college experience and maintains an aviation A&P license.

3.3 Level of Effort

See Section 3.1, Project Management.

3.4 Subcontractors

The following subcontractors have been contacted by HART to work on the Remedial Investigation of the Millington and satellite sites:

Test Borings and Monitor Well Installation:

Dean Anderson
Empire Soils, Inc.
300 McGaw Road
Raritan Center
Edison, NJ 08837
(201) 225-0202

Surveying and Mapping:

Fred Platt
Azzolina & Feury Engineering Co.
30 Madison Avenue
Paramus, NJ 07652
(201) 845-8500

Engineering Properties Analysis:

Jack Boschuk
J & L Testing Company
113 Kimber Drive
Bridgeville, PA 15017
(412) 787-7144

Soil and Water Analysis:

Bob Ueberbacher
YWC, Inc.
200 Monroe Turnpike
Monroe, CT 06468
(203) 261-4458

Air Analysis:

Gene Denison
Princeton Testing Laboratory
P.O. Box 3108
U.S. Highway 1
(609) 452-9050

Aquatic Impact Assessment:

Anita Freudenthal, pH.D.
Cedar Creek STP
Marine Ecology Section
P.O. Box 88; Building A
Wantagh, NY 11793
(516) 781-7373

3.5 Reporting

National Gypsum shall submit detailed progress reports to EPA on the fifteenth day of every month following the effective date of this Order. The progress reports shall include the results of sampling and analysis, including all raw data and any available QA/QC evaluations with supporting documentation.

Written reports to EPA will be completed and routed to the appropriate persons as per requirements in the Consent Order.

As provided in the Contingency Plan, National Gypsum will notify EPA in the event of any emergencies.

Upon request by EPA, National Gypsum will provide EPA or its designated representative with duplicate and/or split samples of any samples collected in furtherance of work performed in accordance with the Consent Order.

Upon request by EPA, all data and information, including raw sampling and other monitoring data, generated pursuant to the Consent Order will be made available to EPA or its designated representative. All such data will be preserved for eight years unless an EPA lawyer approves in writing a shorter preservation period.

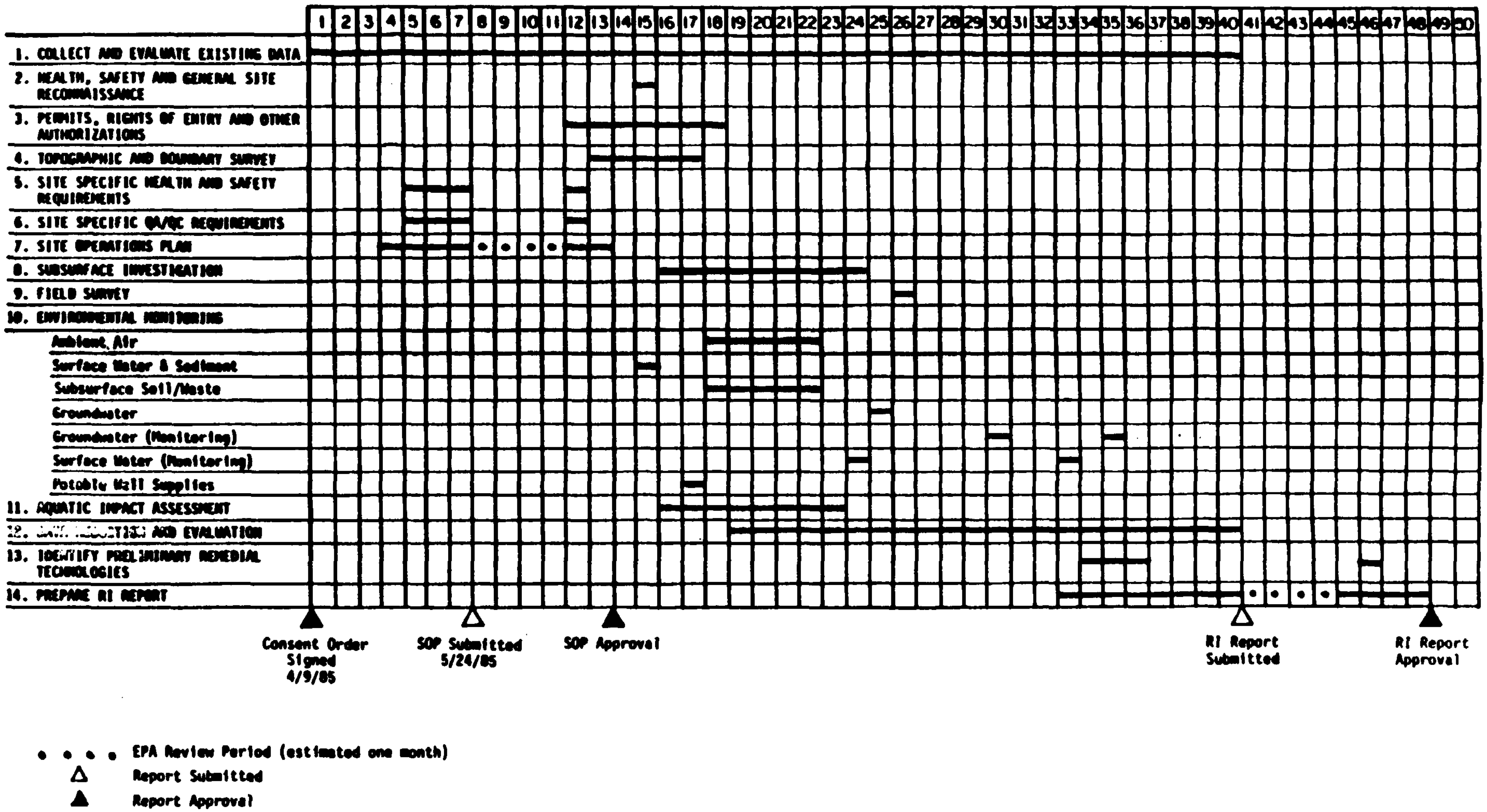
4.0 Project Schedule

Figure 4-1 provides a schedule of the Remedial Investigation for the Millington, Great Swamp, 257 New Vernon Road, and White Bridge Road Sites in New Jersey.

FIGURE 4-1

REMEDIAL INVESTIGATION SCHEDULE

MILLINGTON AND SATELLITE SITES, MORRIS COUNTY, NJ



5.0 WORK/QUALITY ASSURANCE PROJECT PLAN

REMEDIAL INVESTIGATION
(Millington, Great Swamp, White Bridge Road
and 257 New Vernon Road Sites)

Prepared for:

U.S. Environmental Protection Agency
Region II

Prepared by:

Fred C. Hart Associates, Inc.
530 Fifth Avenue
New York, New York 10036

Project Manager

Thomas J. Morahan
Thomas J. Morahan

Quality Assurance Officer

Frances B. Barker
Frances B. Barker

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5.0 WORK/QUALITY ASSURANCE PROJECT PLAN

PROJECT NAME: National Gypsum - Remedial Investigation Millington, Great Swamp, White Bridge Road, and 257 New Vernon Road Sites

PROJECT REQUESTED BY: USEPA - Region II

DATE OF REQUEST: April 9, 1985

DATE OF PROJECT INITIATION: April 9, 1985

PROJECT MANAGER: Thomas J. Morahan

QUALITY ASSURANCE OFFICER: Frances B. Barker

5.1 Project Description

National Gypsum Company has consented to undertake a Remedial Investigation/Feasibility Study (RI/FS) at the Millington Site, and the Great Swamp, White Bridge Road and 257 New Vernon Road Sites ("the satellite sites") in Morris County, New Jersey, to assess the impacts of the sites to human health and the environment and to evaluate remedial alternatives. The goal of this program is to evaluate the presence of potential contaminants, the migration potential of the contaminants, if present, and the most feasible remedial activity. The data will be used to determine the stability of the asbestos pile at the Millington Site, and the extent and magnitude of contamination of the soils, surface waters and groundwaters in the vicinity of all the sites. The results of the data evaluation will be used to select the most feasible remedial alternative required to alleviate any contamination problems.

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5.2 Monitoring Network Design and Rationale

See Section 2.0 of this Site Operations Plan.

5.3 Projected Sampling Program

Table 5-1 shows the monitoring parameters and their frequency of collection. Table 5-2 provides the analytical methods and sample preservation techniques for each parameter and matrix. Table 5-3 lists QA sample parameters.

5.4 Project Schedule

See Section 4.0 of this Site Operations Plan.

5.5 Project Organization and Responsibility

The following is a list of key personnel and their corresponding responsibilities:

Bruce Mackie/Loretta Hoglund (HART)	- sampling operations
Frances Barker (HART)	- sampling QC
Daniel Ott (YWC, Inc.)	- laboratory analysis
James Frisbee (PTL)	
Jeffrey Curran (YWC, Inc.)	- laboratory QC
Gene Denison (PTL)	
Jeffrey Curran (YWC, Inc.)	- data processing activities
Jeffrey Curran (YWC, Inc.)	- data processing QC
Frances Barker (HART)	- data quality review
Dennis Farley (HART)	- performance auditing
Frances Barker (HART)	- systems auditing
Frances Barker (HART)	- overall QA
Thomas Morahan (HART)	- overall project coordination

Figure 3-1 (see Section 3.0) provides an organizational chart for this project.

TABLE 5-1

MONITORING PROGRAM AND FREQUENCY OF COLLECTION

Matrix	No. of Samples**	Parameters	Frequency of Collection	Laboratory	Field Replicates	Field Blanks	Trip Blanks***
Ambient Air	31	Asbestos Fiber Count	At least one sample at each well during drilling	PTL	4	0	4
	5	Asbestos Fiber Count (TEM)	Two samples for each test pit	PTL	0	0	1
Surface Water	24	PP +40 Parameters	One Event	YWC	2	1	0
	3	PP Volatile Organics	One Event	YWC	0	0	3
	24	Asbestos Fiber Count	One Event	PTL	2	1	0
	24	Indicator Parameters*	Two Events	YWC	2	1	3
Groundwater Monitoring Wells	27	PP +40 Parameters	One Event	YWC	2	2	0
	3	PP Volatile Organics	One Event	YWC	0	0	3
	26	Asbestos Fiber Count	One Event	PTL	2	1	0
	27	Indicator Parameters*	Two Events	YWC	2	2	3
Sediment	17	PP +40 Parameters	One Event	YWC	1	1	0
	1	PP Volatile Organics	One Event	YWC	0	0	1
	16	Asbestos Fiber Count	One Event	PTL	1	0	0
Subsurface Soil	46	PP +40 Parameters	Throughout hydrogeologic investigation	YWC	4	2	0
	2	PP Volatile Organics		YWC	0	0	2
	24	Engineering Properties	Throughout hydrogeologic investigation	J&L	0	0	0
Potable wells	12	PP +40 Parameters	One Event	YWC	1	1	0
	1	PP Volatile Organics	One Event	YWC	0	0	1
	11	Asbestos Fiber Count	One Event	PTL	1	0	0

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TABLE 5-1

MONITORING PROGRAM AND FREQUENCY OF COLLECTION

PP = Priority Pollutants.

+40 = Analysis will tentatively identify the 15 highest volatile organic fraction peaks, 10 highest acid extractable organic fraction peaks, and the 15 highest base/neutral organic fraction peaks, along with their estimated concentrations, using the EPA/NIH/NBS Mass Spectral library search.

* Indicator parameters will be selected from the PP scan after review of the analytical results from the initial sampling survey.

** Includes QA samples.

*** A trip blank will accompany every shipment of volatile organic samples.

TABLE 5-2

PARAMETER TABLE

Parameter	No. of Samples	Sample Matrix	Analytical Method Reference	Sample Preservation	Holding Time	Container
*PP Volatiles	54	Aqueous	Ref. 1	Cool, 4°C***	7 days	40 ml glass vials, Teflo lined septum
**PP Base Neutral/Acid Exractables	54	Aqueous	Ref. 1	Cool, 4°C	7 days until extraction, 40 days after extraction	1 l amber glass bottles Teflon lined cap
PP Pesticides and PCBs	54	Aqueous	Ref. 1	Cool, 4°C	7 days until extraction, 40 days after extraction	1 l amber glass bottles Teflon lined cap
PP Metals	54	Aqueous	Ref. 2	Filter groundwater samples on-site, acidify all samples with HNO_3 to pH LT 2	6 months	500 or 1 l linear polyethylene bottles
Asbestos Fiber Count	54	Aqueous	See Appendix A	Cool, 4°C	None	1 l polyethylene bottles
*PP Volatiles	55	Soils/Sediment	Ref. 1 (See Appendix A)	Cool, 4°C	10 days until extraction 40 days after extraction	8 oz glass bottles Teflon lined cap
**PP Base Neutral/Acid	55	Soils/Sediment	Ref. 1 (See Appendix A)	Cool, 4°C	10 days until extraction 40 days after extraction	8 oz glass bottles Teflon lined cap
PP Pesticides and PCBs	55	Soils/Sediment	Ref. 1 (See Appendix A)	Cool, 4°C	10 days until extraction 40 days after extraction	8 oz glass bottles Teflon lined cap
PP Metals	55	Soils/Sediment	Ref. 2	None	None	8 oz glass bottles

TABLE 5-2 (Continued)

PARAMETER TABLE

Parameter	No. of Samples	Sample Matrix	Analytical Method Reference	Sample Preservation	Holding Time	Container
Asbestos Fiber Count	15	Sediment	See Appendix A	None	None	Glass Bottles
Asbestos Fiber Count	23	Air	See Appendix A	None	None	Filters in cassettes
Asbestos Fiber Count	4	Air	Transmission Electron Micro- scopy (See Appendix A)	None	None	Filters in cassettes

1. "Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration," USEPA Contract Laboratory Program, revised July 1985.

2. "Statement of Work for Inorganic Analysis Multi-Media, Multi-Concentration," USEPA Contract Laboratory Program, revised July 1985.

PP - Priority Pollutant.

* Includes tentative identification of the 15 highhest volatile organic fracton peaks and their estimated concentrations using the EPA/NIH/NBS Mass Spectral library search.

** Includes tentative identification of the 10 highest acid extractable fraction peaks and 15 highest base/neutral organic fraction peaks, and their estimated concentrations using the EPA/NIH/NBS Mass Spectral library search.

*** Sodium thiosulfate will be added to volatile organics samples if residual chlorine is present.

TABLE 5-3

QA PARAMETER TABLE

	Parameter	No. of Samples	Sample Matrix	Analytical Method Reference	Sample Preservation	Holding Time	Container
				********************See Table 5-2****************			
Field Replicate	Asbestos Fiber Count	4	Air				
Trip Blank	Asbestos Fiber Count	4	Air				
Trip Blank	Asbestos Fiber Count**	1	Air				
Field Replicate	PP +40 Parameters	5	Aqueous				
Field Blank	PP +40 Parameters	4	Aqueous				
Trip Blank*	PP Volatile Organics	7	Aqueous				
Field Replicate	Asbestos Fiber Count	5	Aqueous				
Field Blank	Asbestos Fiber Count	2	Aqueous				
Field Replicate	PP +40 Parameters	5	Soil/Sediment				
Field Blank	PP +40 Parameters	3	Soil/Sediment				
Trip Blank*	PP Volatile Organics	3	Soil/Sediment				
Field Replicate	Asbestos Fiber Count	1	Soil/Sediment				

PP - Priority Pollutants

* A trip blank will be sent with every shipment of volatile organic samples.

** Analysis will be done by transmission electron microscopy.

Note: For a breakdown of QA samples, see Table 5-1.

5.6 Data Quality Requirements and Assessments

The data quality requirements for all samples for this project are provided in Appendix B. Additional information regarding QA for Priority Pollutant Analyses can be found in YWC's Standard Operating Procedures Manual (Appendix C).

5.6.1 Data Representativeness

Based on review of meteorological conditions, ambient air samples will be collected downwind and as near as possible to the point at which the drill enters the soil. In addition, at least one trip blank and replicate air sample will be collected at each site. The trip blank will consist of a clean filter which will accompany the samples to the field and back to the laboratory without being used for sampling. The replicate sample will be collected simultaneously with another sample and will be used to check the reproducibility of the data.

Monitoring wells will be flushed three to five casing volumes prior to taking samples to ensure that a representative sample has been obtained from the aquifers. At least three well volumes or several holding tank volumes will be evacuated prior to potable well sample collection. If possible, potable well samples will be collected before any treatment systems. In addition, aerating devices will be removed prior to sample collection.

Background and upstream surface water/sediment samples will be collected and compared to samples collected immediately downstream of each of the four sites. In addition, surface water samples will be collected from midstream; sediment samples will be collected from depositional areas. All soil samples will be selected by a random process to ensure representativeness.

5.6.2 Data Comparability

All aqueous sample data for Priority Pollutants (PP) plus forty analysis will be reported in ug/l (ppb). All soil/sediment samples for PP plus forty analysis will be reported in ug/kg (ppb). All water samples for asbestos fiber count will be reported in fibers/liter (f/l). Asbestos fiber counts of sediment samples will be reported as percent of fibers and percent of sample. All ambient air samples will be reported in fibers/cubic centimeter (f/cc). Sampling protocol will be strictly adhered to.

5.6.3 Data Completeness

Less than 100 percent of the samples may be collected due to potable well accessibility problems and poor recovery of stream sediments and soils in split spoons (geologic data). The valid data required from the laboratory will be 90 percent of the samples submitted.

5.7 Sampling Procedure

Sampling procedures are provided in Section 2.0 of the Site Operations Plan.

5.8 Sample Custody Procedures

Sampling team personnel will perform all sampling and will retain custody until shipment to the laboratory. One chain-of-custody form will be used for each sample cooler shipped to YWC for analysis. One chain-of-custody form will be used for each ambient air sample or sample cooler shipped to PTL. Figures 5-1 through 5-4 provide samples of chain-of-custody forms.

The field activities will be recorded daily in a serialized field logbook. The following information will be recorded in the logbook used at this site:

1. Where, exactly, was the sample taken?

2. Who took the sample, and who witnessed it?

3. Date and time of sample collection.

FIGURE 5-1

CHAIN-OF-CUSTODY

Sample No.____

Field Custody

SAMPLE TYPE:

____	Groundwater	____	Soil
____	Surface Water	____	Sediment
____	Leachate	____	Waste, Solid
____	River, Lake, etc.	____	Waste, Liquid
____	Ocean, Bay	____	Air

COLLECTOR'S NAME: ____________________

AFFILIATION: ____________________

LOCATION: ____________________

____

____

If shipped, shipper's name: ____________________

SAMPLE RECEIVER: ____________________

____

CHAIN OF POSSESSION:

Signature	Title	Inclusive Dates

Relinquished to:

Signature	Title	Inclusive Dates

SPECIFIC ANALYSES:

	Parameter		Parameter		Parameter
____	Volatiles	____	Cat. Ex. Cap.	____	Nitrite
____	B/N/A	____	BOD	____	TKN
____	Arsenic	____	COD	____	Ammonia
____	Selenium	____	TDS	____	Dioxins
____	Mercury	____	T-alk	____	Asbestos
____	Conven. AA	____	Conductivity	____	Fiber Count
____	TOC	____	Chlorides	____	
____	pH	____	Nitrate	____	

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FIGURE 5-2

SAMPLE NO._____

CHAIN-OF-CUSTODY CHRONICLE
LABORATORY CUSTODY

- Sample received was properly preserved: _______yes_____no
- Sample seal was maintained: _______yes_____ no
- Comments: ____

CHAIN OF POSSESSION:

Signature	Sample Custodian	Inclusive Dates
Relinguished to:		
Signature	Analyst	Inclusive Dates
Relinguished to:		
Signature	Analyst	Inclusive Dates
Relinguished to:		
Signature	Analyst	Inclusive Dates
Signature	Analyst	Inclusive Dates
Signature	Analyst	Inclusive Dates

SPECIFIC ANALYSES:

____	Volatiles	____	Cat. Ex. Cap.	____	Nitrate
____	B/N/A	____	BOD	____	TKN
____	Arsenic	____	COD	____	Ammonia
____	Selenium	____	TDS	____	Dioxins
____	Mercury	____	T-alk	____	Pesticide
____	Conven. AA	____	Conductivity	____	PCBs
____	TOC	____	Chlorides	____	Asbestos
____	pH	____	Nitrate	____	Fiber Count

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YORK LABORATORIES DIVISION

YWC

FIGURE 5-3

CHAIN OF CUSTODY RECORD

CLIENT ______________________________

JOB No. ______________________________

SAMPLE IDENTIFICATION

Sample No.	Sample Description	Condition	Comments

CHAIN OF CUSTODY CHRONICLE:

COLLECTED BY:

1
NAME: ______________________ DATE: ______________________
SIGNATURE: ______________________ SEALS PLACED ON CONTAINERS? ☐ YES ☐ NO

CUSTODY TRANSFERRED TO:

2
NAME: ______________________ DATE: ____________ TIME: ____________
SIGNATURE: ______________________ ARE SEALS INTACT? ☐ YES ☐ NO ☐ N/A

CUSTODY TRANSFERRED TO:

3
NAME: ______________________ DATE: ____________ TIME: ____________
SIGNATURE: ______________________ ARE SEALS INTACT? ☐ YES ☐ NO ☐ N/A

RECEIVED IN LABORATORY BY:

4
NAME: ______________________ DATE: ____________ TIME: ____________
SIGNATURE: ______________________ ARE SEALS INTACT? ☐ YES ☐ NO ☐ N/A

WERE ANY SAMPLES SPLIT WITH ANOTHER PARTY? ☐ YES ☐ NO
IF YES, IDENTIFY: ______________________

Laboratories
Division of Y.W.C., Inc.

FIGURE 5-4
LABORATORY SERVICES REQUEST

Client: ______________________ Job No ____________

Logged by: ______________________________________

Quote: $____

Received by: ______________________ Date: __________

Sample Identification	Parameters to be Determined

pecial Instructions:

4. Sample number, airbill number, seal number.

5. All sampling conditions, i.e., type of material, weather on-site, type of sampling container and preparation, description of sampling procedure, preservation, and shipping.

6. Field measurements of pH, temperature, specific conductance, volumes and characteristics of water removed during the development and flushing of wells, diameter of casing and riser pipe, distance from top of casing to bottom of well screen, distance from top of casing to water table, and pumping rate, where applicable.

YWC will provide the field personnel with sample coolers containing all sample containers necessary for completing field sampling and QC requirements for PP plus forty analysis and asbestos fiber counts. All glassware will be cleaned using EPA protocols. Each lot of sample containers are then checked for cleanliness by the laboratory and closed to prevent contamination. The bottles will be labeled with the following information: site name, sample number, name of collector, date and time of collection, place of collection, type of sample, sample volume, analysis required and preservatives. Field blanks, preservatives, etc., will be added as required by the analytical procedures.

Triacetate filters for collecting asbestos in ambient air will be supplied with the air sampling pumps by PTL. PTL will place the filters into sampling cassettes to be attached to the samplers. Following sampling, the filters in the cassettes will be shipped under full chain-of-custody procedures to PTL for analysis.

Samples will be received at the laboratories by the sample custodians who examine each sample to ensure that it is the expected sample, inspect the sample containers for possible damage, and ensure that the documentation is complete and adequate. The sample custodians will ensure that each sample has been preserved in the manner required by the particular test to be conducted and stored according to the correct procedure.

Preservation and storage of aqueous samples will require maintenance of 4°C until analysis begins. Filters will be stored in desiccators.

5.9 Calibration Procedures, Preventive Maintenance, and Decontamination

A maintenance, calibration, and operation program will be implemented to ensure that routine calibration and maintenance is performed on all field instruments. The program will be administered by the Quality Assurance Officer and the team members. The Quality Assurance Officer performs the scheduled monthly and annual calibration and maintenance; and trained team members perform field calibrations, checks, and instrument maintenance prior to use.

Team members are familiar with the field calibration, operation, and maintenance of the equipment, maintain proficiency, and will perform the prescribed field operating procedures outlined in the Operation and Field Manuals accompanying the respective instruments. They will keep records of all field instrument calibrations and field checks in the field logbooks. If on-site monitoring equipment should fail, the Site Safety Officer will be contacted immediately. He/she will either provide replacement equipment or have the malfunction repaired immediately.

The Century Systems OVA Model 128 will be calibrated by the manufacturer prior to shipment to the job site. A trained team member will perform daily field calibration with Span gas, checks, and instrument maintenance prior to use. Triacetate filters will be loaded into cassettes prior to shipment for sampling. The air sampling pumps will be calibrated before and after sampling using a calibrated flow measurement system. The pH meter and conductivity meter will be calibrated using standard calibration solutions by a trained team member. Maintenance, calibration and equipment operation follow the procedures outlined in EPA's "Technical Methods for Investigation of Sites Containing Hazardous Substances."

5.10 Documentation, Data Reduction, and Reporting

All field data will be entered into bound serialized notebooks. Field notebooks, chain-of-custody forms, field data sheets, and laboratory reports will be filed and stored at HART's offices at 530 Fifth Avenue, New York, New York. These documents are tracked by periodically inventorying them on the HART Document Control Sheet (Figure 5-5) which is submitted as part of the QA/QC report.

5.10.1 Data Reduction and Reporting

Data reduction will be effected by providing to the Quality Assurance Officer periodically updated summary tables with the headings:

Collection Date	Sample Identification Number	Sample Description	Lab No.	Parameter	Concentration	Analysis Date

Data will be reported in the Remedial Investigation Report prepared by HART.

5.11 Data Validation

The precision of the data submitted to HART by YWC and PTL will be checked by comparison of the analytical results from the replicate field samples. The data validity also will be assessed by comparison of field blank and background samples with downgradient and on-site samples. The laboratories will critique their own analytical program by the use of spike addition recoveries, establishing detection limits for each matrix, precision and accuracy control charts, and keeping accurate records of instrument calibrations. The laboratories establish average recoveries for surrogates over time, standard deviations, control and warning limits. When a sample recovery is outside the control limit, the sample analysis

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FIGURE 5-5

PROJECT NO.

HART DOCUMENT CONTROL SHEET
SITE:
LOCATION:

Document No.	Title	In Custody of	Dates	Comments
1				
2				
3				
4				
5				
6				
7				

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is repeated. If upon repetition the sample recovery is outside the control limits, the sample will be deemed unsuitable for the method and no further analysis will be conducted on the sample.

Data validation will be the responsibility of the HART QA/QC Officer in conjunction with the laboratories' QA Officers. Protocols from the following documents will be used to validate the inorganic and organic data for all matrices:

1. Draft Inorganic Data Validation SOP, May 14, 1985.

2. Laboratory Data Validation, Functional Guidelines for Evaluating Organics Analysis, May 28, 1985.

3. Laboratory Data Validation, Functional Guidelines for Evaluating Pesticides/PCBs Analyses, May 28, 1985 (Supplemented on June 24, 1985).

In accordance with the Consent Order, a QA/QC evaluation of laboratory data and sampling and analytical procedures used for each sample obtained will be completed and submitted to EPA within two weeks of completion of laboratory analyses.

5.12 Performance and Systems Audits

YWC is a member of EPA's Contract Laboratory Program. In addition, YWC has analyzed recent performance evaluation samples from a number of agencies. The dates, source of the performance evaluation samples, and parameters analyzed are as follows:

Contract No. and Source	Date	Parameters
PH-0497, Conn DOH	1/85	Organic chemicals, gross hydrocarbons, purgeable hydrocarbons
46410, NJDEP	-	Drinking water parameters, water pollutants

Princeton Testing Laboratory is an active participant in the NIOSH Proficiency Analytical Testing Program (PAT Lab #08540-003) and the EPA Asbestos Bulk Sample Analysis Quality Assurance Program (Lab #2196). Their performance on these criteria has earned them accreditation by the American Industrial Hygiene Association (Accreditation #257) to perform industrial hygiene monitoring. In addition, the laboratory submits performance evaluation samples to the NJDEP (NJ Lab Certification No. 1118) on a quarterly basis.

Corrective actions for laboratory analyses will be handled by consultation between the Laboratories' QA/QC Officers and the HART QA/QC Officer. The Project Manager will make immediate decisions on new protocols to be followed. All changes in laboratory procedures will be documented and reported in the final report.

Mr. Dennis Farley (HART) will be responsible for audits of the field team. At least one performance audit will be conducted during the investigation. The audit will be performed to ensure proper procedures and that subsequent data will be valid. A follow-up audit may be performed near the end of the investigation to show consistency.

The audit will focus on the details of the QA program. This audit will evaluate:

- Project Responsibilities
- Sample Custody Procedures
- Document Control
- Sample Identification System
- QC Corrective Action Procedures

The audit will evaluate the implementation of the project QA program. The audit checklist for field procedures is shown in Figure 5-6. This document will serve as the guide for the audit. The document control audit, presented in Figure 5-7, will be performed by Dennis Farley. A written summary performance audit will be submitted to the EPA's Technical Project Officer as part of the final report.

FIGURE 5-6

PERFORMANCE AUDIT CHECKLISTS

Evidence Audit Checklist

Field Investigation Audit

Project No. ____________________ Date: ____________________

Project Location ____________________ Signature: ____________________

Team Members ____________________

Yes ___ No ___ 1) Has a project coordinator been appointed?
Comments: ____________________

Yes ___ No ___ 2) Was a project plan prepared?
Comments: ____________________

Yes ___ No ___ 3) Was a briefing held for project participants?
Comments ____________________

Yes ___ No ___ 4) Were additional instructions given to project participants?
Comments ____________________

Yes ___ No ___ 5) Is there a written list of sampling locations and descriptions?
Comments ____________________

Yes ___ No ___ 6) Is there a list of accountable field documents checked out to the project coordinator?
Comments: ____________________

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Yes ____ No ____ 7) Is the Transfer of field documents from the coordinator to field participants documented in a logbook?
Comments ________________________________
____
____

Yes ____ No ____ 8) Are samples collected as stated in the project plan or as directed by the coordinator?
Comments ________________________________
____
____

Yes ____ No ____ 9) Are samples collected in the type of containers specified in the project plan or as directed by the coordinator?
Comments ________________________________
____
____

Yes ____ No ____ 10) Are samples preserved as specified in the project plan or as directed by the coordinator?
Comments ________________________________
____
____

Yes ____ No ____ 11) Are the number, frequency, and type of samples collected as specified in the project plan or as directed by the coordinator?
Comments ________________________________
____
____

Yes ____ No ____ 12) Are the number, frequency, and type of measurements and observations taken as specified in the project plan or as directed by the coordinator?
Comments ________________________________
____
____

Yes ____ No ____ 13) Are samples identified with sample tags?
Comments ________________________________
____
____

Yes ____ No ____ 14) Ar. blank and duplicate samples properly identified?
Comments ________________________________
____
____

Yes ____ No ____ 15) Are sample and serial numbers for samples split with other organizations recorded in a logbook or on a chain-of-custody record?
Comments ________________________________
____
____

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Yes ____ No ____ 16) Are samples listed on a chain-of-custody record?
Comments ____________________

Yes ____ No ____ 17) Is chain-of-custody documented and maintained?
Comments ____________________

Yes ____ No ____ 18) Are quality assurance checks performed as directed?
Comments ____________________

Yes ____ No ____ 19) Are photographs documented in Logbooks as required?
Comments ____________________

Yes ____ No ____ 20) Have any accountable documents been lost?
Comments ____________________

Yes ____ No ____ 21) Have any accountable documents been voided?
Comments ____________________

Yes ____ No ____ 22) Have any accountable documents been disposed of?
Comments ____________________

FIGURE 5-7

EVIDENCE AUDIT CHECKLIST

Document Control Audit

Project No. ____________________

Project Location ____________________ Date ____________________

File Location ____________________ Signature ____________________

Yes ___ No ___ 1) Have the individual files been assembled (field investigation, laboratory)?
Comments ____________________

Yes ___ No ___ 2) Is there a list of accountable field documents?
Comments ____________________

Yes ___ No ___ 3) Are all accountable field documents present or accounted for? (Fill out additional checklist)
Comments ____________________

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Corrective action on a day-to-day basis for field sampling will be handled by consultation between the team members and the Team Leader. The Team Leader will make immediate decisions with the team members on new protocols to be followed. All changes in field sampling procedures will be documented in the field logbook and reported in the final report.

5.13 Quality Assurance Reports

In accordance with the Consent Order, a QA/QC evaluation of laboratory data and sampling and analytical procedures used for each sample obtained will be completed and submitted to EPA within two weeks of completion of laboratory analyses.

Monthly reports will be issued by the Project Manager in consultation with the HART Quality Assurance Officer. The reports will include assessment of the status of the project in relation to the agreed upon timetable. The reports will also include, as appropriate, the results of the performance audit and document audits, when they are completed, and any necessary corrective action procedures. A data quality assessment, using field blanks and replicates, will be incorporated into the final report.

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6.0 HEALTH AND SAFETY PROJECT PLAN
REMEDIAL INVESTIGATION
(Millington, Great Swamp,
White Bridge Road and 257
New Vernon Road Sites)

Prepared by:

FRED C. HART ASSOCIATES, INC.
530 Fifth Avenue
New York, NY 10036

Project Manager — Thomas J. Morahan
Thomas J. Morahan

Site Safety Officer — Frances B. Barker
Frances B. Barker

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6.0 Health and Safety Project Plan

This Health and Safety Program exists to protect employees from the hazards encountered during field investigation of uncontrolled hazardous waste sites. It is the result of experience gained from working on hazardous waste sites and handling hazardous materials, as well as consideration of all applicable government regulations and guidelines, and consultation with health and safety experts.

Personnel engaged in field investigations of hazardous waste storage, treatment, and disposal sites and remedial response activities encounter a wide variety of hazards, including potential exposure to toxic chemicals and radiation, fire and explosion hazards, and other physical hazards due to unstable, deteriorating structures. There is a great degree of uncertainty about an abandoned or uncontrolled site at all stages of an investigation, and there may always be a significant risk encountered at these sites.

This Health and Safety Program is intended to comply with the Occupational Health and Safety Act (OSHA) of 1970 and 5 U.S.C. 7902(c)(1).

6.1 Safety Considerations For Remedial Investigation

This section describes the administrative policies and procedures applicable to this remedial investigation.

Although the degree and type of hazard encountered by field team varies greatly depending of the type of site (e.g. abandoned hazardous waste site or active facility) and the detail of field activity (e.g. preliminary site inspection on multimedia sampling, certain administrative policies and procedures must be adhered to. These include use of properly trained personnel, specific criteria for field team organization and size, site characterization to establish hazard level, proper selection, use and maintenance of personal protective equipment, and basic safety procedures.

6.2 Field Team Organization

A field team must be organized to efficiently and safely carry out the objectives of the project. These objectives may include such activities as sampling of hazardous wastes, monitoring well installation, site mapping, metal detection or performing geophysical surveys. The team will typically include individuals with many different technical skills, such as chemists, geologists, and engineers. In addition to performing its task objectives, the team must provide for its own safety to prevent injury or exposure to hazardous materials. This can be accomplished by assignment of specific roles and responsibilities to members of the field team and by assuring that the proper team size is used to effectively accomplish specific objectives.

There are a number of roles which are required for the safe and competent operation of a field investigation team. The five roles which are necessary at every site where a field team will be working are: Project Manager, Field Team Leader, Site Safety Officer, Equipment Specialist, and the Work Party. Additional roles, such as Command Post Supervisor, Personnel Decontamination Station Operator and an Emergency Response Team, are added to the field team when the scope, magnitude, or hazard of the investigation justifies the need for them. A team member may take on more than one role, but the roles must be clearly assigned and must cover all those required rather than describe one team organization for all the different types of field investigations. Guidelines are presented here for assignment of responsibilities to team members to assure safety and for establishing the team size. Figure 6-1 provides an organizational chart which shows the delegation of authority for health and safety purposes.

6.2.1 Project Manager. The Project Manager is responsible for the overall effectiveness of the field investigation. The specific responsibilities of the Project Manager include preparing and organizing all project work assignments, briefing team personnel on specific duties, obtaining permission for site access from the owner or responsible party, completing reports and maintaining the evidentiary file, complying with

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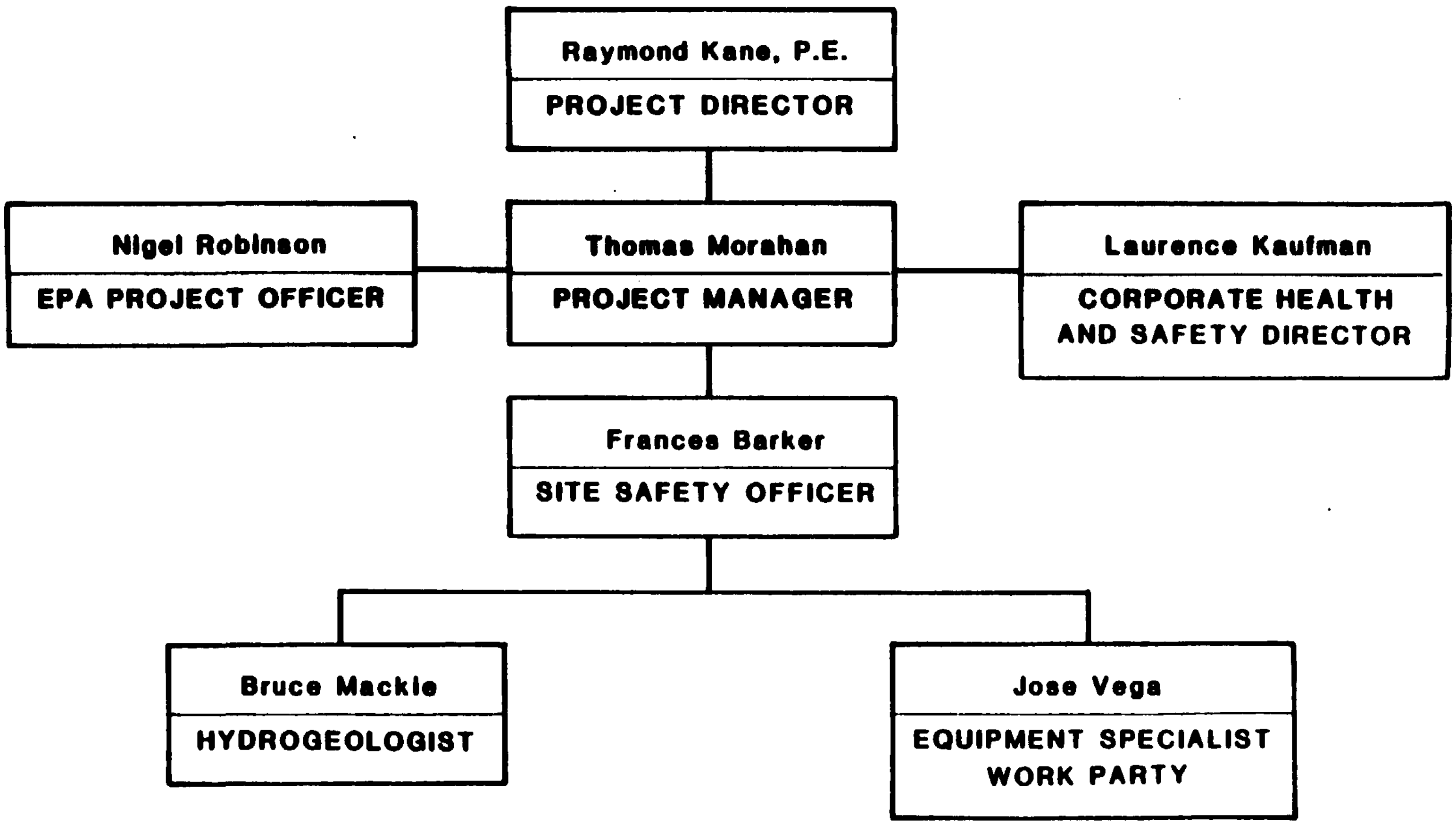
FIGURE 6-1

ORGANIZATIONAL CHART
HEALTH AND SAFETY PROJECT PLAN



chain-of-custody procedures, and coordinating with government representatives and subcontractors.

6.2.2 Field Team Leader. The Field Team Leader is accountable for the organization, operation, and safety of the field team. This role may be filled by the Project Manager. The Field Team Leader is responsible for proper field operations, completion of the objectives of the site work plan, compliance with document control procedures, proper field documentation of activities and operating procedures, and determining the level of personal protection necessary to insure the health and safety of the field team. If subcontractors or outside observers are present, the Field Team Leader must enforce health and safety procedures.

6.2.3 Site Safety Officer. The Site Safety Officer has primary responsibility for all safety procedures and operations on-site. This role may be filled by the Project Manager. The Site Safety Officer is responsible for preparing the site safety plan; upgrading, if necessary, the level of personal protection based upon observations and changing circumstances during the field investigation; enforcing the buddy system (personnel working in pairs); posting and briefing the field team of an approved safety plan which outlines locations, routes, and telephone numbers of the closest medical facilities and poison control centers; posting other emergency telephone numbers, such as the fire and police department and Health and Safety Director; notifying local public emergency personnel; verifying that team members have met the health and safety requirements for field assignment; controlling site entry and exit at the personnel decontamination station; and monitoring the work party for signs of stress such as changes in complexion, lack of coordination, changes in demeanor, and changes in speech pattern through visual observation. During adverse weather conditions, the Site Safety Officer will impliment special precautions to guard against heat stress and cold exposure as described in EPA's "Standard Operating Safety Guides" (November 1984). The Site Safety Officer has the authority to halt any operation that threatens the health or safety of the team.

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6.2.4 Equipment Specialist. The Equipment Specialist is responsible for obtaining, inspecting, and maintaining all equipment in proper operating order. This requires specialized training in maintenance of equipment, such as self-contained breathing apparatus. The Equipment Specialist is responsible for preparing all sampling equipment.

6.2.5 Work Party. The work party is ultimately responsible for the safe and successful completion of the work assignment. The members of the work party share many active and important functions which are necessary to fulfill the objectives of the investigation. These include setting up the personnel decontamination station, performing site hazard characterization, taking photographs, collecting samples of various media, decontaminating sample containers, packaging and shipping the samples in accordance with chain-of-custody procedures, and decontaminating the entire work party prior to leaving the site.

6.3 Field Investigation Team Size

The size of an investigation team is determined by the hazard level of the investigation, the level of protection employed, the objectives of the investigation, and the site characteristics and type of wastes. The team must be large enough to assure safety, but not so excessively large as to sacrifice economy.

6.3.1 Three-Person Team. A minimum of a three-person team consisting of HART personnel will be used at the Millington and three satellite site to collect environmental samples. A three-person team is appropriate for sites where extensive personal decontamination is not required and where the likelihood of emergency rescue is minimal. The three-person team is suitable when up to Level C protection is required. One team member remains outside the exclusion area and acts as Site Safety Officer and Equipment Specialist, as well as assisting with decontamination. In the event of an emergency, the team member can summon outside assistance. All personnel will be required to wear Level C protection on-site during soil disturbance activities and inside exclusion areas. Higher levels of protection will be made available if deemed necessary by the Field Team leader and/or Site Safety Officer. Team responsibilities are identified in the enclosed site safety plan and in Figure 6-1.

6.4 Selection, Use, and Maintenance of Personal Protective Equipment

Proper selection, use and maintenance of respiratory protective equipment and other personal protective equipment is extremely important in protecting the health and safety of field investigation personnel. An inadequate level of protection may result in unnecessary exposure to toxic chemicals or other hazards. An excessively high level of protection may encumber field personnel unnecessarily and result in decreased efficiency, fatigue, and other hazards. Improper use or maintenance of protective equipment also exposes field personnel to unnecessary risks.

The site hazard assessment will be based on a complete site characterization obtained from previous site visits. Once the site hazard assessment is completed, the Site Safety Officer will select the level of protection. The level of protection will be selected in accordance with EPA's "Standard Operating Safety Guides" (November, 1984). The selection is based on the potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done, the toxicity of the suspected or measured chemical substances, and professional experience and judgement. Available background information suggests that exposure to airborne asbestos fibers through inhalation is the greatest potential hazard at the Millington and satellite sites.

6.4.1 Respiratory Protection. The selection of adequate respiratory protection depends primarily on the type of hazardous substances to be encountered. Proper respirator use requires formal training and continued maintenance of the equipment, in accordance with 30 CFR Part 11 and provisions of the National Institute for Occupational Safety and Health. OSHA regulations pertaining to respiratory protection require a training program that encompasses user responsibilities, training for proper use, and respirator maintenance. OSHA also requires qualitative fit testing of facepieces. Facial hair (beards) and wearing contact lenses is prohibited. The following factors will be used to select adequate respiratory protection: exposure limits, oxygen level, warning properties, protection factor, maximum use limit and service concentration limit. These factors are discussed in Section 6.4.1.1.

6.4.1.1 Air-Purifying Respirator (APR). The APR, which will be available to team members and will be used at the Millington and satellite sites until airborne asbestos and organic vapor concentrations are determined, removes contaminants from the atmosphere to some degree and can be used only in atmospheres containing sufficient oxygen to sustain life (this is usually not a problem in open air) and when other criteria, discussed below, are met.

Specific concentration limitations exist for specific devices. The chemical-cartridge respirator provides respiratory protection against certain gases and vapors in concentrations not in excess of that labeled on the cartridge. It can only be used in an area where minimal concentrations might occur and where self-contained breathing apparatus (SCBA) has been determined unnecessary. Ambient air concentrations at these sites will be determined by collecting air samples for asbestos fiber counts and using the organic vapor analyzer. Many types of cartridges are available and field personnel will select the appropriate one for the contaminants expected.

Air-purifying respirators or cartridge respirators are worn when:

- Any unidentified and potentially hazardous odor is detected.
- Hazardous materials in the air are not greater than 10 times the permissible exposure limit (PEL), and have good warning properties.
- The Project Manager judges that respirators are needed as a precaution against generation of low levels of toxic substances in air due to sampling, handling, decontaminating, or other operations.
- The capacity of the cartridge will not be exceeded by extended periods of use on-site. (If used for extended periods, cartridges must be changed.)

Users of air-purifying respirators must comply with the following:

- At least 19.5 percent oxygen must be present for respirator use or unprotected breathing.
- Cartridge respirators do not supply oxygen. They are of no use in oxygen-deficient atmospheres.
- Air-purifying respirators provide less protection than SCBAs and other supplied air devices.
- Air-purifying respirators must be NIOSH-approved.
- Cartridges also must be NIOSH-approved and should be matched to the respirator by the manufacturer.
- Cartridges must not be used past the expiration date.
- Air-purifying respirators will provide adequate protection only if they have good face seals. A qualitative fit test is required for each employee using these respirators.
- Upon experiencing any warning property such as difficulty breathing, eye irritation, headache, strong taste, or smell, the user must immediately leave the site. The Field Team Leader or Site Safety Officer may require that a user of an air-purifying respirator carry an emergency escape air mask.
- Users of air-purifying respirators must follow the manufacturer's instructions on the donning and use of the equipment.

6.4.2 Protective Clothing. Protective clothing must be worn by all personnel at hazardous waste sites to prevent skin exposure and to minimize spread of contamination. All on-site operations require protective clothing. Protective clothing may include, but is not limited to chemical-resistant pants and jackets or coveralls, disposable tyvek coveralls with hoods, steel toe and shank boots, protective gloves, hard hats, face shields, and chemical safety glasses or splash goggles for splash protection. Once adequate protective clothing is chosen, employees must also note that alertness is a significant safety factor. Since protective clothing is cumbersome, it hastens the on-set of fatigue and heat exhaustion, it can decrease alertness, and it limits stay-time.

The following section describes Level C protective equipment which is appropriate for the Millington and satellite sites.

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6.4.2.1 Level C. Level C will be worn on-site during all soil disturbance activities and inside exclusion areas. Level C protection is used when the required level of respiratory protections is known, or reasonably assumed to be, not greater than the level of protection afforded by air-purifying respirators. According to OSHA, reusable air-purifying respirators are adequate for asbestos levels up to 20 fibres per cubic centimeter. Since personnel will be wetting down the asbestos during drilling and test pit operations, airborne asbestos levels at the sites are not expected to exceed 20 fibres per cubic centimeter. Thus, level C protective equipment will be adequate for all site operations during this investigation.

Level C protection consists of:

- Air-purifying respirator (previously described) with appropriate cartridges for asbestos fibers and organic vapors.
- Tyvek coveralls with hood
- Boots/shoes, safety, with steel toe and shank
- Hard hat with optional faceshield
- Gloves

Modified Level D. Modified Level D protection will be adequate on-site in areas outside exclusion zones during non-soil disturbance activities and at offsite sampling locations. Level D is the basic work uniform and is used where significant exposure to hazardous materials is unlikely. Field personnel must not be permitted to work in civilian clothes.

Modified Level D protection consists of:

- Coveralls, cotton
- Boots/shoes, safety with steel toe and shank
- Safety glasses or chemical splash goggles*
- Hard hat with optional face shield
- Air-purifying respirator (readily available)*

* optional

6.5 Basic Safety Practice

Field personnel will observe basic safety practices. The Health and Safety Director will be responsible for informing all field personnel of these practices. They will include, but not be limited to, the following:

- Observe the buddy system (work in pairs)
- Eating, drinking, and smoking are prohibited on-site
- Alcohol consumption is prohibited 24 hours prior to and 24 hours after being on a hazardous waste site
- Contact lenses will not be worn
- Avoid obvious contaminated objects/areas and do not sit or kneel on the ground
- Do not climb over drums or obstacles
- Maintain contact with the Site Safety Officer

6.6 Site Safety Plans

A written site safety plan must be prepared prior to any field operation. The purpose of the form is to provide information about the site being investigated, an evaluation of the hazards present, and the plan developed to protect the field personnel and to prepare for emergency action. The plan is prepared by the Site Safety Officer and submitted to the Health and Safety Director for review and approval prior to the operation.

A standard form is used for the site safety plan. The site safety plan has five parts. The first part provides general information, including the name and location of the site and the objective(s) of the investigation. The second part provides information on the site and waste characteristics, including a description of the facility and its history. The third part of the form is a hazard evaluation, which assesses the potential hazards to site inspection personnel, based on available information. The fourth part of the form is the work plan itself. It establishes the work area, the personal protection (level of protection and equipment) to be used, decontamination procedures, site entry procedures, the site entry team members and their responsibilities, and work limitations. The last part of the form provides emergency information, including emergency contacts and resources, and emergency routes to hospitals or other facilities.

The site safety plan must contain specific information describing the safety precautions and procedures to be used and justification for them. The hazard evaluation is a key part of the form, since the plan must be developed on the basis of the evaluation of known or potential hazards. If hazard information (e.g. possibility of explosive or toxic atmospheres) is not available, the site safety plan must include a procedure for obtaining the necessary information or for protecting personnel from unknown but potential hazards.

6.6.1 Reporting Incidents Involving Personal Injury or Exposure to Hazardous Materials. All incidents involving personal injury or exposure to potentially hazardous materials during any field activity must be documented and reported immediately to the Health and Safety Director. A standardized incident report is used for this purpose.

It is important to report all exposures and injuries, even though the incident is not considered serious or no adverse health effects or symptoms are apparent at the time. Often exposure to a toxic agent may have delayed or latent effects which may only be detected by specific diagnostic tests. Documenting an exposure may aid in identifying the cause of symptoms or changes in health status indicators (diagnostic blood tests or pulmonary function, for example) at a later time. Likewise, an injury, such as an eye injury caused by dust particles, may result in delayed damage to the eye.

6.6.2 Site-Specific Safety Plan. The site-specific safety plan for the Millington and three satellite sites are detailed in Table 6-1. The safety plan provides information on site/waste characterizations, hazards, work plan, investigation-derived material disposal plan, and emergency/contingency information.

Level C protection will be adequate on-site during all soil disturbance activities and inside exclusion zones. Air-purifying respirators with HEPA/organic vapor cartridges will be worn until airborne asbestos levels are determined. Samples for asbestos fiber counts will be collected throughout the subsurface investigation. Following air sampling, air-purifying respirators with cartridges for asbestos will be used only if the results indicate asbestos concentrations at one half of the OSHA standard for asbestos which is 2 fibers/ cubic centimeter. Respirators will not be required during sampling of groundwater, surface water or sediment.

A Century Systems Organic Vapor Analyzer (OVA) Model 128 will also be used during the subsurface investigation to measure discrete total volatile organic concentrations. The instrument will be capable of operation in the gas chromagraph (GC) mode, if necessary. Discrete volatile organic readings will be taken constantly at the field team work areas. If OVA readings in excess of 10-15 ppm are obtained, the OVA will be run in the GC mode to estimate the percentages of methane and non-methane hydrocarbons. If non-methane hydrocarbons exceed 5 ppm at any location, personnel will wear air-purifying respirators. A three-person team will collect the soil, air, sediment surface water, and groundwater samples.

Field investigations and sampling activities may result in the generation of contaminated materials. Proper sampling planning must include a management plan for the disposal of materials encountered during field investigations in order to minimize the impact to the environment and the risk to public health. The contaminated materials which may be generated include waste groundwater, decontamination rinse water, and used disposable clothing. Disposable clothing will be containerized for proper disposal. Decontamination rinse water and waste groundwater will be collected, pumped into a tanker and sampled to determine the appropriate disposal method.

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TABLE 6-1

SITE SAFETY PLAN

A. GENERAL INFORMATION

SITE: Millington and Satellite Sites PROJECT NO.: A048

LOCATION: Morris County, NJ

PREPARED BY: Bruce Mackie DATE: 5/9/85

APPROVED BY: Francie Barker DATE: 5/23/85

OBJECTIVE(S): Conduct sampling for remedial investigation to identify extent and magnitude of contaminated air, soil, sediment, surface water groundwater and determine stability of asbestos pile.

PROPOSED DATE(S) OF INVESTIGATION Summer 1985

BACKGROUND REVIEW: COMPLETE: X PRELIMINARY:

DOCUMENTATION/SUMMARY: OVERALL HAZARD: SERIOUS

MODERATE

LOW X

UNKNOWN

B. SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): LIQUID SOLID X SLUDGE GAS

CHARACTERISTIC(S): CORROSIVE IGNITABLE RADIOACTIVE

VOLATILE X TOXIC REACTIVE UNKNOWN OTHER (NAME): Pathogenic

FACILITY DESCRIPTION: Former manufacturer of asbestos siding and shingles

PRINCIPAL DISPOSAL METHOD (type and location): Dumping of asbestos fibers and tiles at all sites, plus discharge of phenylmercuric acetate at the Millington Site.

UNUSUAL FEATURES (dike integrity, power lines, terrain, etc.) Sites located adjacent to Passaic River or its tributaries. One site located in Great Swamp National Wildlife Refuge.

STATUS (active, inactive, unknown): Inactive

HISTORY (worker or nonworker injury; compliants from public; previous agency action): Site inspections conducted by the EPA and NJDEP during during 1983 revealed presence of asbestos and phenylmercuric acetate.

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C. HAZARD EVALUATION

Potential contamination of air and soils from asbestos wastes. Drilling and soil disturbance during sampling could exacerbate airborne asbestos and organic vapor levels.

D. SITE SAFETY WORK PLAN

PERIMETER ESTABLISHMENT: MAP/SKETCH ATTACHED: No SITE SECURED? No

PERIMETER IDENTIFIED: No ZONE(S) OF CONTAINMENT IDENTIFIED? No

PERSONNEL PROTECTION

LEVEL OF PROTECTION: A B C X D

MODIFICATIONS: An air-purifying respirator with HEPA/organic vapor cartridges will be worn during on-site soil disturbance activities, including drilling and excavation of test pits, and inside exclusion zones, until airborne asbestos and organic vapor levels are established. Respirators will not be required during sampling of groundwater, surface water or sediment.

SURVEILLANCE EQUIPMENT AND MATERIALS: Organic Vapor Analyzer, air sampling pumps.

DECONTAMINATION PROCEDURES: Washing boots and gloves with detergent and water; steam cleaning of drilling equipment between borings at separate established site. Field clean-up with Alconox, tap water rinse, deionized water rinse, methanol rinse, and air-dry or deionized water rinse.

SPECIAL EQUIPMENT, FACILITIES, OR PROCEDURES:

A water truck or trailer with a self-contained pump, hose and mist applicator will be kept at the sites during drilling and test pit opreations to wet down the asbestos. This procedure will aid in keeping airborne asbestos levels to a minimum.

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SITE ENTRY PROCEDURES: To be arranged with the EPA, NJDEP and local municipal authorities.

TEAM MEMBER (Major)	RESPONSIBILITY
Tom Morahan	Project Manager
Francie Barker	Field Team leader/Quality Assurance Officer/Site Safety Officer.
Bruce Mackie	Hydrogeologist/Groundwater Sampling
Jose Vega	Work Party/Equipment Specialist

WORK LIMITATIONS (time of day, etc.): Daylight hours

INVESTIGATION-DERIVED MATERIAL DISPOSAL: Disposable clothes will be drummed and properly disposed. Decontamination water and waste groundwater will be collected, pumped into a tanker and sampled. Disposal methods will depend on sampling results.

E. EMERGENCY INFORMATION

	LOCAL RESOURCES	
AMBULANCE:	(201) 522-2232	
HOSPITAL EMERGENCY ROOM:	(201) 522-2232	Overlook Hospital, Summit, NJ
POISON CONTROL CENTER:	(201) 522-2232	Overlook Hospital, Summit, NJ
POLICE:	(201) 647-1800	Passaic Township
FIRE DEPARTMENT:	(201) 647-1800	Passaic Township

AIRPORT	(201) 647-2444	Somerset Airport, Bedminster, NJ
EXPLOSIVES UNIT:	(201) 647-1800	Passaic Township
EPA CONTACT:	(201) 264-2657	Nigel Robinson, New York, NY

SITE RESOURCES

WATER SUPPLY:	At TIFA, Ltd. Plant	(201) 647-4570
TELEPHONE:	At TIFA, Ltd. Plant	(201) 647-4570
RADIO:	No	
OTHER:	N/A	

EMERGENCY CONTACTS

CORPORATE SAFETY DIRECTOR	Laurence Kaufman	(202) 223-5621
PROJECT MANAGER	Tom Morahan	(212) 840-3990
HART OFFICE		(212) 840-3990

F. EMERGENCY ROUTES

(give road or other directions; attach map)

HOSPITAL: Overlook Hospital, 183 Morris Avenue, Summit, NJ (see attached map.)

OTHER: None

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7.0 Contingency Plan

The objective of the contingency plan is to minimize hazards to human health and the environment for fires, explosions or any unplanned releases of wastes into the air, soil, or surface water that may occur during the field activities. In the event that a fire, spill or other emergency situation develops, the site safety officer will be the emergency coordinator responsible for coordinating all emergency response measures. This person has the authority to commit all resources necessary to carry out the contingency plan. The emergency coordinator will be Ms. Frances Barker. The alternate emergency coordinator will be Mr. Bruce Mackie.

7.1 Implementation of Contingency Plan

In case of an emergency situation, the emergency coordinator has full authority to make the decision concerning the implementation of the contingency plan. Depending on the degree of seriousness, the following potential emergencies might call for the implementation of the contingency plan at the 257 New Vernon Road, White Bridge Road, Millington and the Great Swamp Sites.

Spills. Spills of drummed contaminated water will be absorbed with an absorbent, such as Speedy-Dri, and contaminated absorbent and soil will be drummed. Contaminated materials will be properly disposed.

Spills of fuels, hydraulic oils or other petroleum products will be cleaned up using absorbent, shovels and rakes. The spilled material will be placed in plastic bags, buckets and/or 55 gallon drums for transport and disposal. All fueling and maintenance of the equipment will be conducted at least 50 feet from rivers, streams, and ponds.

Flooding. If a flood or mudflow should occur due to a heavy rainfall, the area will be evacuated immediately.

Release of Asbestos. During the drilling operations and test pit excavation, fibrous asbestos may be disturbed and become airborne. If this occurs, water will be used to wet the asbestos, thereby lowering the levels of asbestos in the air. As a contingency, a water truck or trailer with a self-contained pump, hose, and mist applicator will be kept at the site during drilling and test pit excavation.

Emergency Response Procedures. In the event of a non-acute emergency, the procedures listed below will be followed:

1. Any employee discovering or causing a non-acute emergency situation must immediately contact the emergency coordinator.

2. The emergency coordinator will assess the situation and contact the appropriate personnel to respond to the emergency situation.

3. The emergency coordinator will take all necessary measures to contain the hazard and to prevent its spread to the environment and to adjacent homes.

4. Safety measures will be taken to ensure maximum protection of emergency personnel and will include the use of appropriate protection equipment.

5. All non-emergency personnel will be removed from the hazard area until the hazard has been contained and controlled.

6. Following containment and control of the emergency, the emergency coordinator will assess the situation to determine if all contaminated wastes generated by the emergency personnel have been collected and disposed of on-site.

7. The emergency coordinator will ensure that all emergency equipment is restored to full operational status by the emergency personnel.

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8. The emergency coordinator will investigate the cause of the emergency and will take steps to prevent the recurrence of such an incident.

9. The emergency coordinator will notify Morris County or Passaic County Health Department.

10. If necessary, the emergency coordinator will submit a written report of the incident to the Administrator of EPA Region II.

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